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# Implementing an institutional e-learning centre: guiding notes and patterns

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## E-LEN: a network of e-learning centres

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### Workpackage 1 Deliverable

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### **Part 1: Introduction to the guiding notes and patterns:**

- 1.1 Who is this document for?
- 1.2 Rationale for a guiding document on implementing an e-learning centre
- 1.3 How should this document be used?
- 1.4 Origins – the E-LEN project and survey of e-learning centres
- 1.5 An introduction to design patterns and a pattern language
- 1.6 Acknowledgements
- 1.7 Feedback

### **Part 2: Implementing an e-learning centre: guiding notes**

- 2.1 Why e-learning and what is an e-learning centre? Our opening definitions
- 2.2 An e-learning strategy
- 2.3 Setting up an e-learning centre
- 2.4 Rationale for an e-learning centre
- 2.5 Issues and challenges established e-learning centres are facing
- 2.6 Pitfalls to avoid
- 2.7 Scenarios and kinds of e-learning centre
  - 2.7.1 Scenario for a support or service orientation
  - 2.7.2 Scenario for an innovation in e-learning orientation
  - 2.7.3 Scenario for a course development orientation
  - 2.7.4 Scenario for a research in e-learning orientation
- 2.8 The need for establishing an e-learning community: internally and through external links

### **Part 3: Implementing an e-learning centre: organisational design patterns**

- 3.1 Towards a pattern language for the organisational design of an e-learning centre

- 3.2 Patterns for potential e-learning centre purposes
  - 3.2.1 A support or service role pattern
  - 3.2.2 Supporting innovation in e-learning role pattern
  - 3.2.3 E-learning course development role pattern
  - 3.2.4 E-learning research role pattern
- 3.3 Patterns within a support or service role orientation e-learning centre
  - 3.3.1 Pattern for services and activities
  - 3.3.2 Pattern for human and physical resources
  - 3.3.3 Pattern for e-learning centre organisation
  - 3.3.4 Pattern for quality assurance and quality enhancement mechanisms

#### **Part 4: Resources for implementing e-learning centres [to be added]**

- 4.1 Web sites
- 4.2 Readings relating to e-learning centres
- 4.3 References

#### **Figures**

- Figure 1: The structure of a design pattern
- Figure 2: Towards a strategy for e-learning
- Figure 3: Aspects in an e-learning strategy
- Figure 4: The e-learning centre development cycle and influences upon it
- Figure 5: A diagrammatic representation of an e-learning infrastructure
- Figure 6: Evolving a strategy for development of an e-learning centre
- Figure 7: A schematic representation of a pattern language for e-learning centre implementation
- Figure 8: A schematic representation of the root for an e-learning centre
- Figure 9: A representation of the support or service role orientation pattern
- Figure 10: A representation of the innovation in e-learning role of an e-learning centre pattern
- Figure 11: A representation of the course development role of an e-learning centre pattern
- Figure 12: A representation of the research role of an e-learning centre pattern

Figure 13: A representation for a pattern for services and activities in a service or support role e-learning centre

Figure 14: A representation for a pattern for human and physical resources in a service or support role e-learning centre

Figure 15: A representation for a pattern for organisation in a service or support role e-learning centre

Figure 16: A representation for a quality assurance mechanisms in a service or support role e-learning centre

## **Tables**

Table 1: a summary of the key distinctions and similarities between the four orientations for an e-learning centre

## Part 1: Introduction

### 1.1 Who is this document for?

This document is written for staff based in educational institutions who are wishing to set up an e-learning centre within their own institution. This includes:

(a) the higher education sector (because new learning centres are being established with the aid of existing ones and faculty members will be informed about R&D trends, best practice etc in the e-learning field); and

(b) large companies and public sector organisations which are setting up their own e-learning centres, in order to support greater and better use of e-learning for internal training and performance improvement purposes.

We have written this booklet for people who are thinking seriously about making use of e-learning through the development and implementation of an e-learning centre. You may be some distance away from a firm decision – wanting to know more before making choices that will have significant consequences for how you spend your time and resources. Or you may already be committed to this path and looking for advice about how to make a success of the enterprise. We have designed the booklet with the idea of helping staff who are in this transition area between initial interest and full commitment. That said, we hope it will also be of use to people who have set up or are already in the process of setting up their own e-learning centre and are reflecting on what they've done and how it might be enriched or improved. We also have in mind the specialist staff in educational development units. We hope you may find parts of this book useful, either in improving your general understanding about e-learning centres or in supporting staff development activities.

### 1.2 Rationale for a guiding document on implementing an e-learning centre

This document is a tangible result of our work on the EU-funded E-LEN project. (For more information on E-LEN please see Section 1.4 below).

We believe this set of guiding notes and patterns is important for the educational design work of developing and implementing e-learning centres, and to do this work in a systematic and coherent manner. This document therefore offers a set of organisational and pedagogical guiding notes, presented as a set of design patterns, to help in the development of an e-learning centre in a systematic and rigorous way.

Educational design work with current tools and methods reveals the difficulties in creating a balance between rigour and prescriptiveness *and* in finding appropriate levels of generality, such that solutions to problems are worthy of being shared. Guidelines on best practice in educational design can be vague and unsupported by research, albeit presented as handy 'tips and tricks', but often they are without underpinning theoretical and practical rigour. Sometimes they can be too tightly prescriptive and specified so that they are seen as relevant only to certain contexts or situations. In this document we introduce the notion of using 'design patterns'.

Design patterns are intended to offer an alternative and flexible approach to design work that bridges between theory, empirical evidence and experience, and that help resolve practical problems in educational design. According to Frizell and Hubscher (2002) patterns are more flexible than static templates and yet more concrete than abstract guidelines. Patterns are proposed as a means to offer guidance but without constraining creativity.

There are at least three reasons to justify the E-LEN project's production of a set of guiding notes and patterns on best practice in the implementation of an e-learning centre. The first to mention is the need to learn about the know-how, best practices, rules of thumb of implementing e-learning when new organisations, enter the e-learning field. Despite the progress that has been made in the last five years in the use of information and communication technologies in education, many institutes/organisations that think of taking the step to implement electronic learning environments, face the problem of not knowing where to start from, nor what to do. Instead of re-inventing the wheel why not take advantage of the expertise and know-how of existing e-learning centres that has been gathered in our survey and used to produce this guiding notes and patterns document?

Secondly, there is a need to identify, share and disseminate the know-how, best practices, rules of thumb of e-learning between various organizations, already involved in e-learning. E-learning is currently a growing market and a field of rapid continuous development throughout the world. It is expected that the labour market requirements of the new 'knowledge economy' will force higher educational organisations to extend the skills of students in respect to knowledge work, information handling and information and communication technology (ICT) skills. To make effective use of e-learning methods, and to meet these changing educational needs, groups of universities and other educational and training organisations will have to find ways of identifying and sharing best practices, collaborating in the exchange of competence, experiences, 'lessons learnt', tools and materials, etc.

The third reason links to the need to establish more e-learning centres and enhance the existing ones. Higher educational institutes and training centres have started to establish e-learning centres. This is happening in each of the member states, and in all of the countries of Europe, though at very different rates of progress. There is an explicit need to create e-learning centres in each educational institution, corporate company or other organization in order to serve the ever-increasing demands for contemporary technology-based ways of supporting learning and teaching. Furthermore existing e-learning centres can be enhanced by adopting best practices from their peers, in order to respond and adapt to the ever-changing demands for e-learning.

### 1.3 How should this document be used?

We think that it's best not to make your first steps alone. This booklet is written as if the innovative work you are about to undertake is to be carried out by a small team, together with someone providing administrative support and someone helping with the technological aspects.

The knowledge we offer through this booklet is action-oriented but not prescriptive. Rather, we see it as a resource for sharing, discussion and critique. Before you can object that talk is a rather weak form of action, we would also assert that much of the key action in complex organisations is accomplished *through* talk (Boden, 1994). At the heart of what we have to offer lie some ways of discussing and planning co-ordinated action in the domain of e-learning. We offer some empirical and theoretical evidence that we believe you can use to discuss, plan and manage new ventures in e-learning, such as developing e-learning centres.

You will find some example scenarios and worked examples as design patterns, rather than strongly prescriptive recommendations for action. These are intended for use as raw material for thought and discussion. Success lies in clarity of purpose, careful alignment of goals and activities, and a strengthening intuition for what can and can't be made to work. We can offer some good ideas but it is your knowledge of your own context, constraints and opportunities that will be needed to transform these ideas into local practice.

Therefore, the materials we offer can best be approached as a *resource* for collaborative engagement with your colleagues.

The booklet is organised into four main parts: the first outlines the booklet's purposes and rationale; while the second presents guiding notes for practitioners on implementing an e-learning centre. The

third part presents a set of organisational patterns for designing and implementing an e-learning centre. Finally the fourth part includes information on some resources you might find useful in addition to this booklet.

This booklet is very much an evolving one, in that as we continue to gather data from established e-learning centres and continue to canvas for comments and feedback on these guiding notes and patterns, this booklet will be updated and revised. The E-LEN web site will continue to provide access to the latest edition of this document.

## 1.4 Origins – the E-LEN project and survey of e-learning centres

This document is one of the outcomes of a project funded by the EU under the Socrates programme in Open and Distance Learning. More specifically, the funding of the project rested within the Minerva programme. The E-LEN project was designed to create a network of e-learning centres and leading organisations in the field of learning technologies. The E-LEN network is concerned with developing and delivering pedagogically-informed technology for effective e-learning experiences and has been disseminating these experiences to other institutions. The project team included a number of people who have been e-learning practitioners and researchers since the late 1980's. So this booklet draws on their accumulated expertise as well as on a growing literature and on some of the outcomes of the research we carried out within the project.

There were three main objectives for the E-LEN project and these were:

1. *to establish the necessary infrastructure and organisational structure for the network of e-learning centres,*
2. *to identify and gather best practices, "design patterns", research roadmaps on e-learning and to enhance the dissemination of such results*
3. *to produce guidelines on best practice for establishing e-learning centres*

In this booklet, we focus mainly on the third objective, partly because that is where our core expertise lies but also because this is the area in which we have conducted research with established e-learning centres. However, we do also focus on the second objective, in using the E-LEN work on design patterns as a conceptual framework for our notes and guidance on establishing an e-learning centre.

In order to achieve this third objective of the project relating to establishing guidelines for the implementation of e-learning centres, the project had the following intermediate goals:

- to survey the administrative, managerial, pedagogical, technical, research and developmental characteristics of existing e-learning centres
- to review current literature and partner experiences on establishing e-learning centres and thus
- to derive a set of organisational and pedagogical guidelines on forming their own learning centre in a systematic way, and make these available to all interested parties

For the purposes of the E-LEN project we have defined *e-learning* as:

the systematic use of networked multimedia computer technologies to empower learners, improve learning, connect learners to people and resources supportive of their needs, and to integrate learning with performance and individual with organisational goals (Goodyear, xxxx)

The following definition of an *e-learning centre* has been developed in the ELEN project and has been used to inform the E-LEN research work:

An e-learning centre is established for serving the learning needs of students, faculty and staff of an educational/training organisation, for the deployment of innovative curriculum pedagogy and state-of-the-art learning

technology in real courses, and for the development of new learning technologies guided by theory and validated by observation of practice

A survey has been conducted with established e-learning centre staff. We initially conducted the survey with E-LEN partners who have an e-learning centre in their institution, by questionnaire or telephone interview. The sample was then extended by surveying three e-learning centres based in UK universities. We are also undertaking a web-based survey, using a questionnaire to broaden the range and number of e-learning centres surveyed. The data from the web-based survey will be used to update and refine this booklet.

We have used the survey findings to inform our pattern development work. The patterns are tangible resources, planned as part of this document to augment our guiding notes for educational developers, to assist in the setting up and maintenance of pedagogically informed e-learning centres. Our original proposal (in the E-LEN project) had been to produce a set of guidelines. We now offer this alternative document with guiding notes and patterns as a more practically oriented but less prescriptive approach than a set of guidelines. In this following section we say a little more about the idea of patterns for educational design work.

## 1.5 An introduction to design patterns and a pattern language

In this booklet we explore using organisational design patterns as aids for the design and development of e-learning centres. Design patterns are being used as a means to capture and present solutions to design problems (eg Avgeriou *et al*, 2003; Frizell & Hubscher, 2002). They are also being used to facilitate communication among the members of a design team.

Goodyear *et al* (2004) draw upon the organisational and communication framework derived from Christopher Alexander's work in architecture (eg Alexander *et al*, 1977) on pattern languages, to propose the use of patterns for participatory educational design work in higher education. Goodyear *et al* also identify that patterns have also been applied within the field of software engineering and discuss using patterns in the design of networked learning environments, that is, environments for e-learning. It is asserted that designing for educational purposes such as in Higher Education, is a complex task which can benefit from better tools and methods. The use of patterns offers an alternative and innovative approach.

But what do we understand by the term 'design pattern'? According to Alexander *et al*, a pattern is a solution to a recurrent problem in a context. A pattern is used to:

describe a problem that occurs over and over again in our environment, and then describes the core of the solution to that problem in such a way that you can use this solution a million times over, without ever doing it the same way twice.  
(Alexander *et al*, 1977, pX)

The relationships between individual patterns are important and the network created between patterns helps constitute what Alexander *et al* termed a 'pattern language'. High level patterns and related patterns at the same level, help provide context to lower level patterns. Lower level patterns complete and embellish higher level patterns.

Goodyear *et al* (2004) further claim that patterns also have a teaching function, by being written in ways that help the reader to understand enough of a problem and its solution that they could adapt the pattern to their own purposes. They have value in illustrating and explaining a recurring problem and its solution. Alexander's position is explicitly value laden – he refers to 'quality without a name' – that his designs are seeking to nurture and create a convivial environment (Goodyear *et al*, 2004, p451).



Patterns are being promoted and used in the E-LEN project and elsewhere (eg see the Pedagogical Patterns project website at [www.pedagogicalpatterns.org/](http://www.pedagogicalpatterns.org/)). The Pointer project is also concerned with patterns, investigating the appropriateness of patterns as a means of communicating information about how people interact with each other through and around technology. ([www.comp.lancs.ac.uk/computing/research/cseg/projects/pointer/pointer.html](http://www.comp.lancs.ac.uk/computing/research/cseg/projects/pointer/pointer.html)) Patterns can be used as an innovative approach for teams of educational developers: eg by their use as a shared tool for collaborative and iterative design work (Goodyear, 2004).

We are using patterns in this booklet to discuss some of the key aspects concerning the implementation of an e-learning centre within an institution, with an emphasis on the purposes and pedagogical principles that will help to successfully support such an initiative. This document therefore concerns the application of the pattern approach to an organisational design problem, namely that of setting up an e-learning centre.

We have found in our work on design patterns that patterns need to be drafted, shared and critiqued through extensive collaborative moments: the information they present is not new or invented, rather it is derived from sharing and critiquing examples of successful solutions (Frizell & Hubscher, 2002). Indeed, Averigou *et al* (2003) assert:

patterns are not conceived in a big band but rather discovered or mined after numerous implementations of the same solution ... usually by different people. It is a process of reverse engineering the systems that embed good design, in order to make that design explicit and to be able to communicate it to others'

The development of organisational patterns for educational facilities such as e-learning centres began with our analysis of established e-learning centres in the E-LEN project survey (Steeple & Zenios, 2003). We have used the data gathered from the survey to begin to create the organisational patterns for e-learning centres. These organisational patterns will similarly benefit from the use of the pattern approach of collaborative sharing and critiquing. This document is therefore intended to assist teams in HE and educational organisations in working through such collaborative and iterative development processes, critiquing and embellishing the patterns to the specifics of particular contexts, ie to make the patterns useful to particular needs and situations.

Design patterns normally consist of a number of standard elements drawn from Alexander *et al*'s (1977) work, but adapted for our purposes in the context of educational design. A pattern normally begins with a NAME followed by the CONTEXT for the pattern (where the pattern fits within a pattern language structure especially how it fits with larger patterns). The PROBLEM is next stated, followed by some ANALYSIS of the problem. A SOLUTION is next presented, drawing upon known solutions, followed by any CONDITIONS applicable to this pattern. Finally RELATED PATTERNS are named, that is patterns that are integral to or directly associated with this pattern.

NAME
CONTEXT
PROBLEM
ANALYSIS
SOLUTION
CONDITIONS
RELATED PATTERNS

**Figure 1: the structure of a design pattern**

The patterns we present for implementing an e-learning centre are presented in part 3 of this booklet. Each pattern is organised as part of a schematic structure and featuring the following kinds of aspects in the SOLUTION section of each pattern, eg: vision; risk assessment; educational principles; infrastructure; infostructure; support services; budget and resources; research and development; and benchmarking.

## **1.6 Acknowledgements**

We would like to thank all of the participants in our project for their generous assistance. Our thanks are due to EU Minerva for providing a substantial part of the funding of this project, to CSALT Lancaster University for providing the balance of funding, and to E-LEN project partners for their advice and encouragement. We would like to thank all the individuals who gave up their time to be interviewed, the respondents to our surveys and especially those members of staff in various institutions who allowed us to disrupt their normal activities with interviews and survey materials.

We would especially like to thank Alice Jesmont who has carefully transcribed all our interviews and assisted locally with project administrative matters.

## **1.7 Feedback**

One of the reasons for creating this document and making it available on the E-LEN project website – apart from any intrinsic usefulness – is that we want it to act as a magnet for additional kinds and areas of guidance, advice, experience and evidence.

We would be especially glad to receive feedback from people with experience of e-learning who have ideas to share on establishing e-learning centres. Such contributions would be very valuable. We would also be grateful for feedback from people who have tried using the booklet for its intended purpose. Any improvements we can make will be of value to future users of the booklet throughout the HE and training sectors.

The email address to contact us is directly is [Christine.Smith@lancaster.ac.uk](mailto:Christine.Smith@lancaster.ac.uk). You can contact us direct or express your opinions through the E-LEN website at <http://www2.tisip.no/E-LEN/>

## Part 2: Implementing an e-learning centre: guiding notes

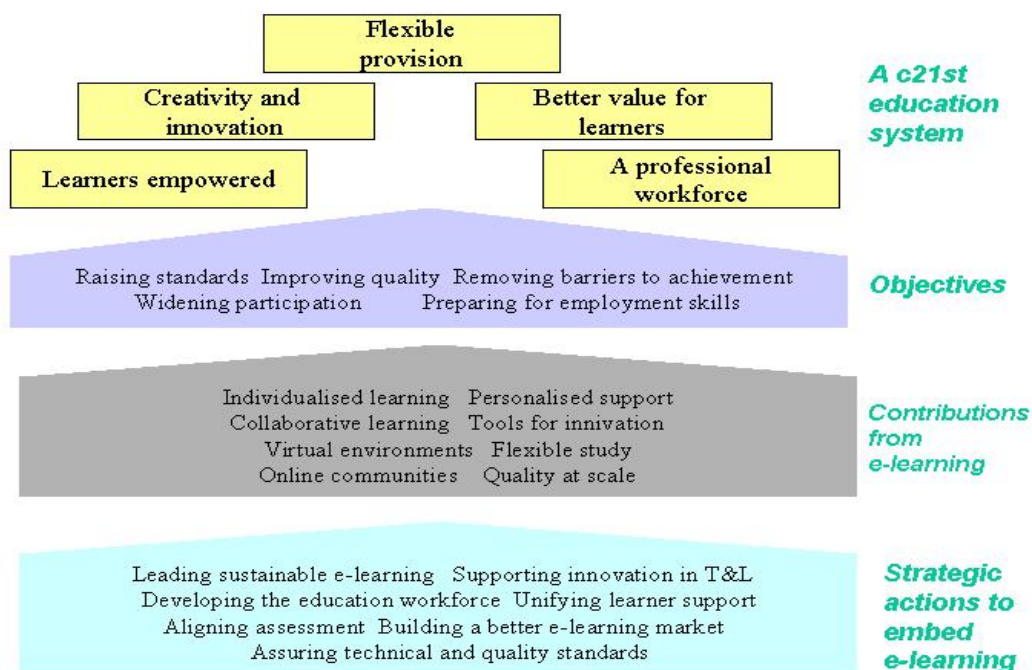
### 2.1 Why e-learning and what is an e-learning centre? Our opening definitions

Before we can really begin to rationalise the reasons for establishing an e-learning centre within an institution, it is perhaps worth reviewing why we feel *e-learning* itself is important. The growth of e-learning is likely to be substantial through economic factors, but it is also being pushed by learner demands for flexibility and more learner-centred learning. E-learning is seen to offer an innovative and flexible means to support and enable quality learning and teaching.

Charles Clarke's report to DfES states:

*e-learning has the power to transform the way we learn, and to bring high quality, accessible learning to everyone – so that every learner can achieve his or her full potential.* (DfES, 2003, p2)

We have drawn upon this DfES consultation document of July 2003 (DfES, 2003) and the figure below to consider the fit of e-learning to national and international trends in learning and teaching.



**Figure 2: Towards a strategy for e-learning (adapted from DfES presentation, 2003)**

A 21<sup>st</sup> century education system, according to the DfES report, needs to reflect the following five goals. It needs to:

1. offer flexible provision to a diverse range of learners
2. support and enable the development of a professional workforce, creating skilled graduates capable of problem solving and creative thinking
3. empower learners to make choices about how, when and where they learn and with what and whom.
4. needs to offer better value for students in supporting their learning in ways best for their particular needs and goals and in timely and cost-effective ways.

5. support creativity and innovation not only in the mainstream research activities, but also in approaches to teaching and the support of learning

To achieve these goals the report suggests a number of objectives for Higher Education Institutions (HEIs). These include for HEIs to accommodate diversity and improve the quality of teaching and learning and to be more open, less constraining and narrowly prescriptive. It suggests e-learning can offer important contributions to these goals and objectives by providing for:

- individual learning patterns with asynchronous and synchronous access to resources and guides online
- personalised support
- collaborative learning – whether in groups or pairs
- opportunities to support connections to others including remotely
- new technological tools that can support innovative forms of teaching and learning
- virtual environments
- flexible study offered to an increasingly diverse student population
- online communities to connect and engage with others
- quality at scale, asynchronous environments in particular are scaleable

A number of strategic actions are also described, designed to embed e-learning across an institution. These are actions that can affect all levels of the institution and although no explicit mention is made of the implementation of an e-learning centre, we would argue these actions are central goals for an e-learning centre. They include the following seven activities for an e-learning centre and its staff:

1. Leading sustainable e-learning
2. Supporting innovative uses of e-learning
3. Educating the workforce in use of e-learning
4. Unifying learner support in use of e-learning
5. Aligning assessment of e-learning
6. Building a better e-learning market
7. Assuring technical and quality standards in e-learning

We feel these strategic actions help provide the incentives for an e-learning centre's design. They are useful to help shape the centre's purposes and activities or roles. They suggest the following kinds of role for e-learning centre staff: advising, supporting, designing, developing, evaluating, promoting, researching, coordinating, filtering, and assisting. We pick up on these kinds of specific activities and roles when we explore the practical implications of implementing an e-learning centre in Part 3 of this booklet. We describe a set of practical patterns for organisation of e-learning centres.

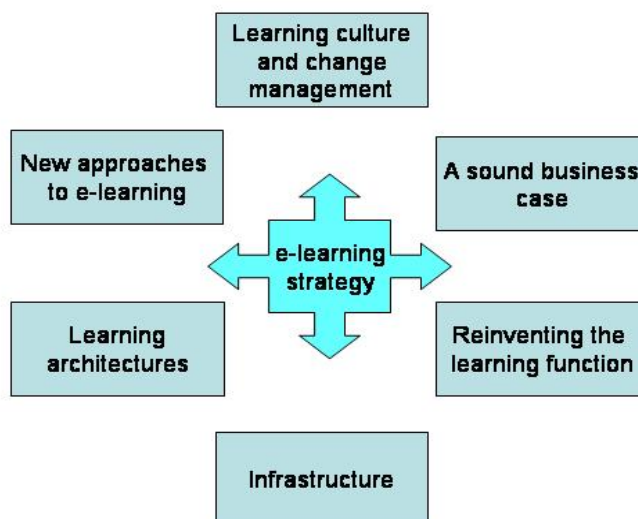
However, in the next section, we explore further some of the key elements needed within an e-learning strategy, of which one action we propose will be the establishment of an e-learning centre.

## **An e-learning strategy**

Strategic actions need to be part of an institutional e-learning strategy. An e-learning strategy is needed given the scale and scope of the investment in ICT needed for effective e-learning development, implementation and take-up. A strategy also acknowledges the successes already achieved in using ICT for teaching and learning, using them to provide a strong foundation for further development work.

E-learning is no longer an experiment. It has moved into the mainstream of educational design and can provide ways to enhance the quality of the learning experience. However, institutions need to create a vision of the desired end state to begin any strategic planning. A strategy needs to operationalise activities that will enhance the institutional core values, while positioning the institution for the demands and opportunities of innovative technology. According to Garrison and Anderson (2003), the winning strategy is to find relatively low-risk niche areas in which the technology can be understood and incubated and where, if there are failures, they will come early and will be less expensive.

An e-learning strategy needs to involve consideration of the following aspects of the institutional functions in terms of e-learning potential, as depicted in the figure below (figure 3).



**Figure 3: aspects in an e-learning strategy**

We need to consider *new approaches to e-learning*. This includes looking at the diversity in potential forms of e-learning available, eg: online training; courseware and simulations; knowledge management tools; as well as access to informational databases; and the use of performance support tools.

We need to consider the changing roles for students and tutors enabled by e-learning and the opportunities presented to create communities of enquiry and convivial and collegial learning spaces.

We need to look at the institutional ‘learning architectures’ including the coordination of e-learning with the rest of the organisation’s learning efforts. This includes considering how to build synergies with traditional teaching methods such as face-to-face lectures and seminars and how to create structures for learning that integrate e-learning eg into on-campus face-to-face approaches ie blended learning approaches.

We need to consider the institutional infrastructure, that is the technical services and support for e-learning; the use and maintenance of the VLE; the customising needed to meet specific needs and the standardising needed across different programmes and disciplines for coherence and ease of management.

We need to consider the learning culture, management ownership and change management of the institution: eg looking at how learning and teaching are organised, enabled and supported in departments across the institution; and how people will manage change in switching to or implementing e-learning.

We need to present a sound business case for the development eg that setting up an e-learning centre is to be carefully funded and economically justified. The plans might include proposals for pump-priming funding and for evaluation of successes as well as plans for sustaining the e-learning centre, and for embedding e-learning across the institution.

We also need to plan and prepare for policy development that puts change at the heart of the e-learning strategy. Institutional policy must be developed to provide direction and to focus sufficient resources to facilitate what is likely to be a long and difficult process. According to Garrison and Anderson (2003) a policy document needs to be systemic and needs to cover:

- 1 *A vision* with an understanding of the background, defining the core values and describing strategic goals that are attainable and have institutional support.
- 2 *A needs and risk assessment* that identifies issues, challenges and best practices
- 3 *Educational principles* and outcomes described
- 4 *Implementation initiatives and strategy* that links to institutional priorities, gives leadership with authority and creates a steering committee and identifies communities of practice
- 5 *Infrastructure* including the design of multimedia spaces and administrative processes
- 6 *Infostructure* including the design of institutional connectivity, that creates a knowledge management system, provides digital content and that creates standards
- 7 *Support services* to provide professional development and learner support
- 8 *Budget and resourcing arrangements* need to be outlined
- 9 *A research and development framework* in order to remain current and innovative
- 10 *Benchmarking* that establish success criteria, assess progress and communicate direction and accomplishments in order that e-learning remains a priority and that support is sustained

(Adapted from Garrison & Anderson, 2003, pp107-109)

Leadership from senior management in development activity is also essential to get e-learning into the institutional mainstream. Leadership requires openness and integrity and it requires fairness, honesty and respect. A leader must have a vision and must press for it, and keep the vision in line with the larger goals of the institution. The vision needs to be translated into understandable and achievable goals. The leader must show commitment to action and a willingness to make difficult decisions. Commitment to action reflects decisiveness and a strong leader accepts there will be some setbacks, accepts and learns from them and moves on.

academic leadership has a very challenging balancing task that must begin with development of sound policy and ownership of the innovation (Garrison & Anderson, 2003, p107)

In this booklet we are proposing that strategic action plans for e-learning in HE institutions or training organisations should include the development and implementation of an e-learning centre that will have a central and strategic role in enabling and developing the strategic actions for e-learning. Many efforts at using technology for learning have not been sustainable because few saw past the capabilities of new and promising technologies to understand the bigger picture. Many efforts misunderstand the complexities of the interactions between e-learning and the organisation and how truly difficult it is to change people's attitudes about what learning events are and what they can be. A strategic approach is necessary to ensure that e-learning has the best possible chance to succeed. A true e-learning strategy addresses issues of culture, leadership, justification, organisation and change. A comprehensive and well-defined e-learning strategy puts a line in the sand – it helps focus attention and lets users, linked service providers, influences and related agencies know where the plan is

heading. An institutional strategy for e-learning also needs to be complementary to the institutional strategy for teaching, learning and assessment.

A strategy for e-learning needs to be supportive of staff taking innovative actions in developing new forms of teaching and learning. Within the strategy, the actions for e-learning need to be coherently aligned and unified with other forms of learner support and there needs to be clear alignment of assessment mechanisms with e-based teaching and learning. The e-learning strategy must address and determine acceptable standards for technical quality to ensure they are featured and maintained in e-learning applications. The strategy also must provide for staff to be developed: to help them understand and utilise good ways of using e-learning and that e-learning is seen to offer successes to staff and to learners.

However we are fully aware that there are very real weaknesses and problems in the take-up of e-learning. For example, many senior education leaders are still not fully engaging with e-learning. There are fast changes in technology and these lead to little or less attention being paid to exploring new forms of pedagogy. There is too little training or reward for staff getting involved in e-learning.

In the next section we explore further the issues surrounding the development and implementation of an e-learning centre.

## 2.3 Rationale for an e-learning centre

Students are coming to higher education campuses with a broad range of computing skills and viewing computing as a basic tool in their education. They have expectations of access, both on-campus and remotely, to common computing resources such as email, the internet and popular software packages. They are also placing increased demands for more online services encompassing most of the information resources and service functions within the institution. They expect technology to be an integral part of their learning experiences. At the same time, academic staff are placing greater demands for support services such as media specialists, instructional system designers, computing consultants and equipment technicians to assist them in integrating technology into their teaching and learning support practices.

According to Garrison & Anderson (2003) e-learning presents enormous opportunities and risks: thus there must be more than a fragmented approach in how it is used and experienced in learning contexts. We argue e-learning centres have a critical, central role in the systemic take-up of e-learning across an educational institution or organisation and must therefore be developed as part of a strategic plan, aligned to the institutional goals and vision.

*Institutions of higher education have purposely and seriously begun to position themselves with regard to e-learning. They have made serious efforts to move ahead from the public relations rhetoric of suggesting innovation towards becoming leaders in drafting vision, policies and goals with regard to e-learning. These institutions have begun to question and redefine their conceptions of what constitutes a quality learning experience in the context of an ubiquitous, mediated communications environment and have begun to understand where they really do add value. The answer to what distinguishes institutions of higher education is increasingly being seen in terms of the context and process of learning (ie community of inquiry) and not access to content. By revisiting their core values and culture, these institutions are recognising a need to change and are realising that e-learning may be the catalyst and means to significantly enhance the scholarly culture and learning environment.*

Garrison and Anderson 2003, p105

An e-learning centre needs to have the enhancement of the instructional process as one of its key goals. An e-learning centre can offer the following kinds of services, essential for the successful implementation and sustained take-up of e-learning:

- i. Support of academic staff, by working with subject specialists to design and set in place the e-learning infrastructure for courses, modules or programmes of study
- ii. Defining requirements for best e-learning practices and individualised e-learning approaches
- iii. Provision of pedagogic and technical e-learning solutions, suitable for innovative use in a variety of educational settings
- iv. Production of new knowledge about e-learning
- v. Defining requirements for best e-learning practices and individualized e-learning approaches, to help universities maintain leadership positions.
- vi. Provision of pedagogic and technical e-learning solutions suitable for innovative use in a variety of university settings.
- vii. Helping universities to build next generation e-learning tools and services for its core residential and its extended education environment.

As stated earlier, we believe an e-learning centre should take a central role in leading on the following kind of actions within the institutional e-learning development plans:

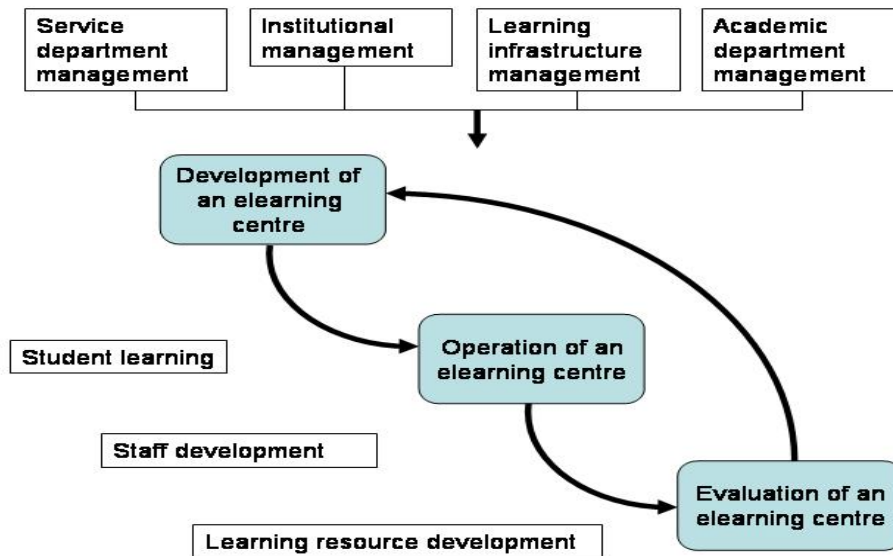
- *Leading sustainable e-learning* – supporting and advising academic staff and other service units in the design and development of e-learning that can be sustained. Supporting the teaching and learning of students whether working directly with them, or more indirectly by supporting staff and helping them in their own professional development
- *Supporting innovation* – advising and supporting academic staff in the development of innovative ways of using e-learning, but informed by sound pedagogical theory. The centre's work should be seen to be innovative eg in how the curriculum and learning environment are designed and that make relevant use of contemporary technologies for learning.
- *Educating the workforce* – helping staff across the institution to know what's possible in creative and appropriate uses of e-learning for learning and teaching, and helping them to achieve and develop their skills and knowledge of e-learning. The successes of the e-learning centre need to be promoted across the institution for wider takeup and for sustaining and embedding e-learning
- *Unifying learner support* – acting in a coordinating role between the various personnel involved in e-learning development so that support for learners is systematic, coherent and appropriate to learner needs. The work of the centre should be guided and informed through knowledge and awareness of research and theory in the field, and through the direct application and rigorous analysis of learning technologies within the institutional context
- *Aligning assessment* – helping academic staff to carefully align their development of e-learning tasks and activities with appropriate and purposeful assessment activities.
- *Building a better e-learning market* – disseminating successful development and promoting effective uses of e-learning both within and outwith the institution.
- *Assuring technical and quality standards* – in the development work undertaken through monitoring and evaluation processes but also through current awareness eg keeping abreast of new technological developments.

Therefore, we regard the design and implementation of e-learning centres as such major tasks that they warrant careful planning and preparatory activity. This set of guiding notes for creating e-learning centres are intended to help to maximise the potential of an e-learning centre. Through the E-LEN project work, we are additionally presenting organisational design patterns that are intended to assist in the design and implementation of e-learning centres.

Below (in figure 4) we depict a development, operation and evaluation life-cycle process for an e-learning centre, and identify the influences upon this cycle. An e-learning centre development and



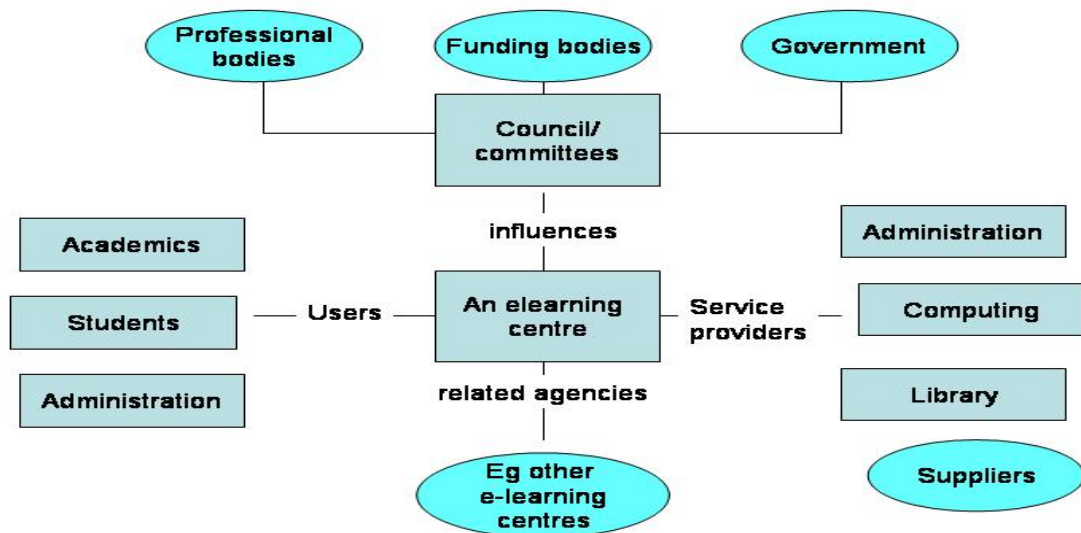
implementation is likely to move through an ongoing cycle, from development and implementation to evaluation and refinement. The influences on this cycle come from top-down eg in other services; also from senior management of the institution, eg those with senior responsibility for teaching and learning across the institution and those in academic management across faculties, schools and departments.



**Figure 4: the e-learning centre development cycle and influences upon it.**

The work of the e-learning centre will impact on (at least) three significant aspects of the institution: directly or indirectly on student learning; on the academic staff who take up the use of e-learning in their teaching; and on the development of e-learning resources and learning materials that includes generic and specific/bespoke resources as well as reusable template designs for e-learning materials and online environments, etc.

In Figure 5 below, we sketch out the institutional infrastructure within which an e-learning centre is typically situated. The e-learning centre is subject to influence from both internal structures as well as directly and indirectly from external structures and organisations, such as professional bodies and government initiatives. The e-learning centre is situated within the institution in relation to other 'service' roles eg the library; as well being situated in the institutional structure in relation to its uses, such as academic staff, students and administrators. The e-learning centre also connects to and articulates with related agencies such as other e-learning centres in cognate institutions.



**Figure 5: a diagrammatic representation of an e-learning infrastructure**

In the next section we examine how the implementation of an e-learning centre needs to be underpinned by its own carefully formulated strategy.

## **2.4 The importance of an e-learning centre strategy and vision for an e-learning centre**

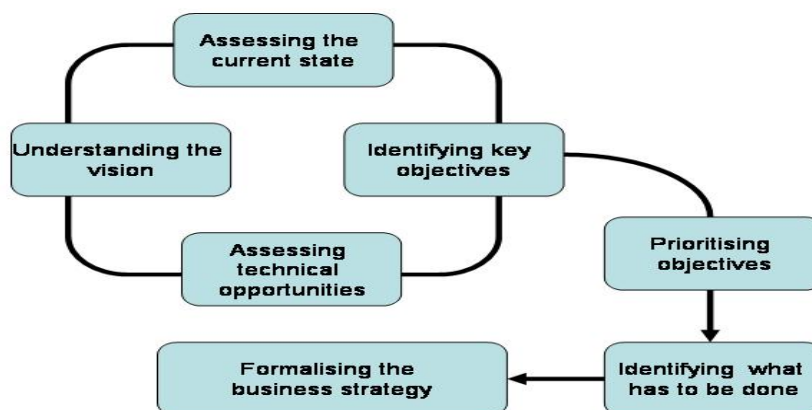
We have drawn upon Ford *et al* (1996) and adapted their notion of a 'learning environment architecture' in proposing the importance of a strategy for development of an e-learning centre. This leads us to suggest a strategic plan will help in creating the right environment and in bringing senior manager on board as 'owners' and thereby to ensure high level commitment to the e-learning centre development. We further suggest establishing a working group including stakeholders for development, such as a steering group and considering use of external consultancy or guidance.

We have adapted and applied Ford *et al*'s approach to consider the systematic planning of an e-learning centre development strategy. The benefits of such a strategy will include providing:

- A forward vision for the centre within the institution
- Help in achieving better internal collaboration in implementing (and running) the centre
- A clear projection of purpose for the centre to the institution and to the outside world
- Help in setting up a successful e-learning centre, ie help in the establishment of a service to systematically provide quality learning environment(s)
- Cost savings: by aligning pedagogical, organisational and business processes; by using a consistent approach; and by managing effective introduction of new learning methods and support services
- A clear business strategy

Figure 6 below is a diagrammatic representation of the key processes in formulating a strategy for development of an e-learning centre. It is useful to consider the sequencing and cycling round these key processes that must be undertaken.

For example we need to begin by assessing the current state and use of elearning across the institution, identifying the current needs and opportunities, analysing the current potential issues associated with meeting these needs and the fit of this development to the overall institutional strategy for learning, teaching and assessment as well as to the e-learning strategic plan.



**Figure 6: evolving a strategy for development of an e-learning centre (adapted from Ford et al, 1996)**

We also need to develop and make explicit our understanding of the vision for the e-learning centre. We need to assess the technical opportunities such as what infrastructure or systems are available eg in a Virtual Learning Environment (VLE). The initial processes also involve identifying key objectives for the e-learning centre development activity.

As a result of these processes of identification and analysis we can begin to prioritise our objectives for achieving the e-learning centre implementation and this leads us into a first specification of what needs to be done first and the sequencing and management of the development. Identifying what has to be done also addresses concerns about who will do what, what resources are required, what people needed, how the work will be monitored and how the development will be evaluated.

The 'final' stage in this is to formalise the strategy leading to a formalised business plan. In the following main part of this booklet (ie in part 3) we also offer a set of organisational design patterns for implementing an e-learning centre that is intended to offer more direct practical support to those involved in e-learning centre development but that is designed to coordinate and articulate with higher level institutional policy developments such as the e-learning strategy and the strategy for teaching, learning and assessment.

## 2.5 Issues and challenges established e-learning centres are facing

The survey we undertook in the E-LEN project revealed a number of very real and pressing issues and challenges facing established e-learning centres. Many of these issues were germane and had resonance for all centre staff interviewed. Amongst these issues, one of the key challenges identified was about finding ways for centre staff to effectively organise their work because of the constant pressure and demands placed on their time, by the centre users. The centre staff talked about needing good but fair ways to prioritise their activities. Another concern was getting and retaining centre staff with the appropriate qualifications and skills to effectively run the centre's activities and services. In

particular, the judicious blending of technological and pedagogical knowledge and competency in individual members of the centre staff, was seen as an extremely valuable but rare commodity.

This booklet attempts to use some of these concerns, challenges and issues as the basis for describing problems as the starting points for producing design patterns for e-learning centres. The next section looks at some of the other barriers and pitfalls in e-learning developments, again highlighting problems we would seek to avoid in future e-learning development work.

## 2.6 Pitfalls to avoid

Brown (2002) has identified a number of barriers or pitfalls to the successful implementation of technology for teaching and learning. He claims that unless these issues are fully addressed, it is unlikely any e-learning innovation will succeed. It is useful to consider these in the process of implementing an e-learning centre: as issues to avoid and against which to take action.

Firstly, Brown suggests *failure to exploit new media* as a barrier. He is critical of use of technology as a substitute media, trying to use it to merely replicate traditional functions such as distributing lecture notes on the web instead of on paper, and missing the additional opportunities presented by technology for new, innovative kinds of support for teaching and learning.

Secondly, *a failure to integrate* is regarded as a barrier. Course developments are attacked for merely 'bolting on' the technology, rather than making the use of technology an integral part of its fundamental design. He refers to the need to 'pedagogically re-engineer' courses to take account of new technology characteristics and related learner needs.

Next is a *failure to generalise*. He comments on the history of technology-based learning being dogged by small-scale developments, with no planning for embedding and sustaining the use of learning technologies beyond the immediate funding period.

*Failure of pedagogy* is next suggested as a barrier. There is a need to move away from transmissive models of teaching and to draw upon contemporary theories of teaching and learning that acknowledge the active role of the learner when designing e-learning solutions.

*Failure of professionalism* is also mentioned as a barrier because of the lack of systematic attention to pedagogical issues in design of e-learning.

Brown further argues that senior managers of institutions are in part responsible for failure in the successful implementation of e-learning. He claims *failure of institutional strategy* and the failure of senior management to grasp the significance and complexity of introducing learning technologies as important barriers to success.

Effective deployment of learning technologies clearly requires an institution to have an adequate IT infrastructure in place allowing students and tutors to readily access resources and support. *Failure of infrastructure* can therefore be another barrier.

*Failure of production* is mentioned because of the dangers of under-resourcing complex developments, particularly those involving multimedia.

Another barrier is *failure of rewards* and here Brown refers to the lack of incentives from institutions to their staff to commit time and effort in order to change and improve teaching and learning support mechanisms.

Furthermore, he suggests a *failure to develop staff skills*, particularly the development of the appropriate skills for online facilitation as a barrier to success.

Finally Brown identifies a *failure to develop student skills* as a barrier to successful implementation of e-learning. Students used to passive learning may find it difficult to deploy more interactive dialogue-based skills without the necessary guidance and support.

## 2.7 Scenarios and orientations for an e-learning centre

E-LEN has been using the following definition for an e-learning centre:

*An e-learning centre is established for serving the learning needs of students, faculty and staff of an educational/training organisation, for the deployment of innovative curriculum pedagogy and state-of-the-art learning technology in real courses, and for the development of new learning technologies guided by theory and validated by observation of practice*

In our analysis of the data gathered from conducting the survey, we identified four distinguishable orientations for an e-learning centre, based around the purposes that respondents identified to us for an e-learning centre. We use the term 'orientation' because in the survey while we found some centres had a very clear and distinct focus, there were other centres who could identify a range of purposes rather than a single one, or that their purpose was changing and would evolve over time and in line with new intentions and strategies.

The four distinguishing orientations were as follows:

Orientation 1: having a support or service of e-learning

Orientation 2: having a support of innovation in e-learning

Orientation 3: having an e-learning course development

Orientation 4: having a remit for research on e-learning

It is useful to make a brief overview for comparison between e-learning centre orientations 1, 2, 3 and 4. Orientation 1 has a strong emphasis on the support of academic staff in the use of learning technology within faculties through providing assistance and advice and by developing applications and resources. Orientations 2 and 4 support integration of e-learning processes across faculties focusing on research, development of innovative learning technology tools and evaluation of e-learning experiences. Orientation 3 leads to a focus on developing and delivering courses online on an institutional or even national/international scale through structured modules.

Orientations 2 and 4 are distinctive from orientation 1 in the sense that they have a stronger research remit as these centres are more likely to be working on long-term projects and to have a broader role in integrating e-learning into the curricula. Orientation 3, although it leads the centre to function mainly as a course provider, may still have a research element often towards keeping up with the latest technological developments, while meeting students' needs. In contrast, orientation 1 centres will tend to have a weaker research element and to work on short-term projects in collaboration with academics, towards developing learning driven technology solutions.

Orientation 1 centres are likely to be working closely with academic staff, helping those staff to re-think how to use technology in order to meet learner needs and to improve quality. In a similar way, centres of orientation 2 or 4 are likely to be working towards meeting staff needs in creating learning environments, but their role is much more extended in having a more strategic role in terms of supporting innovation of the educational system eg through integrating e-learning processes into the curricula. In our survey we found that centres of orientation 3 were functioning mostly off campus, whereas centres of orientation 1, 2 and 4 were functioning mostly on campus. Clearly, the activities of all four orientations of e-learning centres take place both within and outside the institution. With the exception of orientation 2, which in our survey was found to work only with academic staff, the other

three orientations were working both with academic staff and with students. However, these links were weaker in the cases of orientation 3 and 4.

We illustrate the links across these different purposes as well as the contrasts between them in the table below (table 1).

	Support or service role	Innovation role	Course development role	Research role
<b>Services or Activities</b>	Supporting academic staff and students Developing applications and resources Disseminating good practice Provision of e-learning tools and services Training staff Short term project work	Supporting academic staff Training staff Provision of innovative pedagogical and technological solutions to e-learning problems Research and evaluation of e-learning across the institution Longer term project work	Working alongside academic staff developing courses Production of materials Research into e-learning tools and systems	Research on all aspects of e-learning Production of new knowledge Project-based activities
<b>Resources (Human = HR and Physical = PR)</b>	HR- staff with a range of skills in pedagogy and technology in team  PR- centre, equipment, VLE, training materials, demonstration facilities, production facilities for multimedia, dissemination materials	HR- cognitive psychology and instructional design skills, technological skills in person rather than across team  Evaluation and research skills  PR- centre with demonstration facilities, technical system, VLE, training guides	HR- cognitive psychology and instructional design skills.  Design and production skills in multimedia developments.  PR- production equipment, study guides, training materials	HR- research expertise in e-learning pedagogy and technology  PR- centre for research team
<b>Administration</b>	Centre with leader and administrative functions Funding projects Key roles among staff Steering committee	Centre with leader Administrative support Project teams	Centre with leader Administration function	Centre with leader Administrative support Project teams

<b>Quality Assurance</b>	Reporting to Teaching and Learning Board Annual review process Evaluation	Reporting to senior management Annual review process	Reporting to senior management Also to external funders	Reporting to senior management Also to external funders
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**Table 1: a summary of the key distinctions and similarities between the four orientations for an e-learning centre**

In the next section we provide a scenario for each orientation to describe its typical activities, its working arrangements and its organisation.

### **2.7.1 Scenario for a service or support role orientation to an e-learning centre**

The centre is a unit of four staff with skills designed to interface between learning and technology – ie 2 with expertise in pedagogical possibilities of e-learning, 1 with strong technical skills and know how, 1 with multimedia expertise. The unit is serving all faculties, supporting academic staff in course development where e-learning is featured.

The underlying pedagogical model is support of collaborative learning. Therefore, much of the centre's work is setting up discussion spaces in the institutional virtual learning environment to support collaboration among learners. The VLE is also used as an electronic noticeboard for posting teaching materials, course information, library resources eg reading lists. The centre has also made extensive use of templates for course design, to enable rapid design and reusability across subject areas. The other activities of the centre include production of paper based resources eg guides and worksheets.

On a day to day basis staff are involved in one-to-one contact for consultancy, running student technical training at the outset of a course and occasional staff development events for departments. In addition staff undertake some administrative and QA commitments eg reporting on their work on a regular basis to line management.

This centre works in close liaison with other support and service teams eg media unit, library, IT support, and student management systems. It is physically located within a centre for teaching and learning so there is a physical as well as a conceptual close-coupling of the centre's work to a learning or pedagogical focus. Staff work in an open office but have also use of learning technology lab space for development work and this includes a resources room. Facilities include learning technology resources eg video editing suite, videoconferencing facilities

Staff undertake some promotional activity for the centre's work, eg through electronic dissemination internally of course development achievements.

This centre has been designed to align with the institutional strategy for teaching, learning and assessment and this includes a commitment to the use of ICTs to support small group collaborative learning. The centre and the learning technology strategy have grown from enthusiasm of key individuals and departments who have acted as flagships for e-learning development. As such this is very much an evolved model of e-learning centre development.

### **2.7.2 Scenario for a support of innovation orientation to an e-learning centre**

The centre is a unit of nine staff with skills designed to interface between research, pedagogy and technology. The unit is serving all faculties, supporting innovation within the instructional process of the university.

The underlying pedagogical model is about collaborative learning in a problem based curricula context. The centre's work is to set up discussion spaces to enable building of knowledge through encouraging comparisons of students' work, searching for information and sharing of experiences within the institutional virtual learning environment (VLE). Mutual discussion and negotiation of tasks is meant to generate new knowledge.

The other activities of the centre include support of staff in the implementation of the VLE and evaluation of the process of the implementation of learning technology within faculties from initial steps to full integration in their teaching and learning process.

On a day-to-day basis staff are involved in discussions with committees on the uses of technology, writing and maintaining of websites integrated with examples of multimedia use, running induction programmes and technical training sessions for academic staff. In addition staff undertake some QA commitments e.g. reporting on work on regular basis to line management.

This centre works in close liaison with other support and service teams e.g. library, ICT service centre, educational development and research group. It is physically located within the centre of the city having its own building and within a short distance from the faculties. Staff work in offices but have also use of a demonstration room equipped with a smart board for presenting all kinds of applications, which is open for visitors. Staff undertake some promotional activity for the centre's work, e.g. disseminate results within and outside the university through reports.

This centre has been designed to align with the institutional strategy for educational renewal and innovation through implementation of learning technology in teaching and learning across faculties. The centre has grown from initiatives to redesign and improve the educational process in the context of problem-based learning and it contributes in maintaining the institution at a prominent position in educational innovation through developing new knowledge and refining requirements for best practice in the field of learning technology. As such this is very much a strategically planned model of e-learning centre development.

### **2.7.3 Scenario for course development orientation to an e-learning centre**

The centre is a large unit of over thirty staff working part-time and only three staff employed full-time with skills designed to interface between pedagogical, technical, i.e. web design, programming, research and administration. The unit is serving learner needs on a national basis through developing courses, certificates and programmes mostly in the field of computer science.

The underlying pedagogical model is about flexible, self-directed study and experiential learning through structured modules to enable learner autonomy. The centre is developing a certain approach to the development of internet-based courses, though modules that include a set of exercises linked to text or having an open character to be solved by students working remotely individually or in collaboration. The templates used are enriched with advanced technologies such as streaming video. These materials are also provided to campus students as additional resources.

The other activities of the centre include management of an online web based system for registration and administrative support for learners and tutors. In addition the centre participates in learning technology projects and it supports schools and government organisation in running network solutions.

On a day-to-day basis staff are involved in developing learning materials, writing text books, running the portal and supporting students. Staff undertake some QA commitments and evaluate their work against a set of recommendations using student questionnaires and staff focus group discussions.

This centre works in close liaison with the Faculty of Informatics and e-learning and it collaborates with other universities. It is physically located within the Department of Informatics and e-learning having offices with computers and multimedia equipment and meeting rooms. As the centre follows an open and distance mode of learning work with students is conducted online. However, some laboratory exercises are organised on a face-to-face basis, at certain locations across the county.



A marketing strategy group within the centre undertake promotional activity through submitting information about courses offered at educational exhibitions and published materials.

This centre has been designed to align with the institutional strategy for open and flexible learning through the use of networked technology targeted at geographically dispersed students. The centre has grown from governmental initiatives developed to meet learner needs focusing in the area of computer science. As such this is very much a strategically planned model of e-learning centre development.

#### **2.7.4 Scenario for a research into e-learning orientation to an e-learning centre**

This centre is a unit of five staff with skills ranging from research to technical. The unit is involved in five learning and teaching programmes and has links with all faculties in terms of implementing and evaluating experiences in e-learning.

The underlying pedagogical model is about self-responsibility in an e-learner centred framework. These ideas inform a number of projects in progress, which are investigating success conditions and sustainability problems for managing e-learning activities and exploring ways of building up communities of practice.

In relation to the above, the centre is engaged in testing of educational software, tools and resources, integration of audio-visual material and evaluation about the impact of new technology in education. Other activities include consulting services, support for implementation and assessment and assistance with integration of e-learning processes into curricula.

This centre works in partnership with private companies and public institutions. It is physically located within the university. Staff work in an open plan office with computers and multimedia equipment.

Staff undertake some promotional activity for the centre's work, e.g. through electronic dissemination via mailing list.

This centre has been designed to align with the institutional strategy to enhance uses of new media and support of ICT in education and this includes a commitment to improve quality of educational activities and effective learning experiences to assist good practice. The centre seems to have grown from enthusiasm of key individuals and appears to be an evolved model of e-learning centre development having, however, now developed a strategic planning element for future evolution of the centre.

## **2.8 Kinds of skills and roles for e-learning centre staff**

The E-LEN survey revealed that staff in established learning centres have a broad range of skills and areas of knowledge and often undertake a diverse range of roles as part of their work. The skills and knowledge needed by e-learning centre staff as learning technologists have been identified by eg Oliver *et al* (2004). They comment that such staff are new professionals and as such have roles that are hybrid and often marginal, yet their roles are central to institutional processes of change. They suggest their position is *marginal* in that their posts are often on fixed-term contracts and insecure, yet *powerful* in being linked to strategic priorities for the institution such as promoting the take-up of e-learning.

They define a learning technologist as someone:

involved with any of the functions and activities associated with the embedding, development and support of learning technologies or e-learning (Oliver *et al*, 2004: p2)

They also assert that a learning technologist can promote and support change in educational practice and so needs to understand not only the pedagogical principles and the technology available, but also how to make best use of the latter to support and serve those principles. So, as well as specific skills and knowledge focusing on pedagogy and technology, e-learning centre staff need a range of generic and interpersonal competencies *and* organisational and management skills and experience.

Swann and Giunta identified three important dimensions for IT professionals that can be adapted for e-learning centre staff as learning technology professionals:

1. *Technical know-how*: encompassing the depth, scope and integration of technical skills in applying technology
2. *Critical thinking skills*: involving recognising and solving problems, reasoning, making judgements, organising resources and information, applying creative thinking and knowing how to obtain and apply new knowledge
3. *Interactive skills*: involving listening to and communicating with others verbally or in writing and working with others individually or in teams or in a leadership capacity.

To these we would add a fourth and very important dimension for an e-learning centre staff member as a learning technology professional, namely:

4. *Pedagogical know-how*: encompassing an understanding of learning and of relevant approaches to instructional design

Resta (2002) refers to a 1999 US National Research Council report on core skills for IT professionals. The report identified the following as the common core of integrated skills and knowledge needed to accommodate and appropriate current and future generations of technology:

- Sustained reasoning: defining and clarifying problems, followed by sustained attempts at formulating a solution
- Managing complexity: involving a number of tasks including planning a project, designing a solution, integrating components, responding to unexpected interactions and diagnosing what is need for each task
- Solution testing: determining whether a proposed solution meets the design goals and identifying likely cause of failure
- Managing faulty solutions: ability to detect, diagnose and correct problems and faults
- Organising and evaluating information: finding and evaluating information at different levels and structuring information to make it useful
- Collaboration: skills for collaborating including a strategy for division of tasks
- Communication to other audiences: understanding different audience needs and backgrounds and structuring and presenting information appropriately for the non-expert
- Expecting the unexpected: the flexibility to be responsive and adaptable, to mitigate and exploit unforeseen circumstances
- Anticipating changes in technology: being adaptable to new technologies

- Abstract thinking about information and communication technology: the ability to reflect on the use of learning technologies, identifying characteristics and commonalities that cut across technological experiences and how they relate and affect policy issues

The rapid changes in digital technologies and growing complexity of networked environments require learning technology professionals to work continuously to update their skill sets to accommodate the new systems and tools. It is important for educational organisations to recognise the need for continuous professional development of their learning technology professionals. This may take many different forms such as participating in certificated programmes, attending conferences and workshops, and mentoring on the job as well as from reading and participating in research and from development or production work.

Equally the learning technology professional must rise to the challenges of the growing demands for information resources and their changing roles to meet those demands. They must also recognise their leadership role in helping to transform their organisation into a twenty-first institution.

In the design patterns (Part 3) we consider the specific kinds of roles and skills needed for each of the e-learning centre orientations, as well as presenting a pattern for resources (including human resources) for a support or service orientation e-learning centre.

## **2.9 Linking the e-learning centre to other support agencies**

A major goal of most educational organisations today is to infuse technology throughout the instructional and administrative dimensions of the organisation. This has required not only the development of new levels of IT knowledge and skill by academics and administrators, but has also resulted in changes in the role of the learning technology specialist and led to the formation of e-learning centres.

There is a growing need to integrate institutional information and learning resources in their various formats and to share information across traditional organisational boundaries. These factors are changing the boundaries of IT-related units, including e-learning centres, and the roles and responsibilities of e-learning centre staff within educational organisations. For true integration and for embedding an e-learning centre within an institution, e-learning centre staff must develop close collaborative working relationships with other information-related professionals in the organisation. The need to integrate information and learning resources requires the e-learning centre professionals to work closely with instructional staff/academics, administrators, librarians, record managers and archivists, audio-visual production teams, etc.

There is increasing convergence among these specialist areas of work resulting from the convergence of digital technologies. Through collaborative links with other central support units, the e-learning centre staff can facilitate more creative ways of addressing the growing support needs, as well as making better use of existing resources within the institution.

Efforts such as forming campus-wide planning teams or advisory committees are helpful. More important is for learning technology professionals to participate in the highest levels of institutional strategic planning and in resource allocation decisions.

## **2.10 The need for establishing an e-learning community**

A major goal of many educational organisations today is to infuse technology throughout the instructional and administrative dimensions of the organisation. This has required not only the development of new levels of e-learning knowledge and skill by academics and administrators, but has also resulted in changes in the role of the learning technology specialist and led to the formation of institutional e-learning centres.

E-learning centres have a crucial, central role in institutional development and need to position themselves as the central hub for e-learning – helping to create and sustain an e-learning community. The e-learning centre needs to act as a central service provider to its community and as a resource for advice, support and leadership on e-learning within the institution.

In the next part of this booklet we introduce some patterns for the organisational design of an e-learning centre. In presenting any pattern for an e-learning centre, its overall purpose needs first to be set out. The pattern needs to identify the different kinds of centre activity and ways of organising those activities. The pattern needs to identify the kinds of issues faced and pitfalls to avoid. Each design pattern for the different orientations of e-learning centres is being developed to both reflect the distinctions between them, as well as to incorporate similarities. As such they offer practical plans for design action to e-learning design teams.

This part of the booklet presents a set of design patterns for implementing an e-learning centre.

Earlier in this booklet we have suggested that the implementation of an e-learning centre needs to be part of a coordinated plan for e-learning and to fit with institutional strategies eg for learning, teaching an assessment. An e-learning centre development must also be mindful to the specifics of the institutional plan for e-learning, taking account of available resources, physical location and staffing etc as well as of any constraints and limitations.

In a booklet of this kind we cannot come up with specific and precise prescriptions that will be widely acceptable and useful. Rather, we offer these draft patterns as resources to assist in communication and discussion among a team developing an e-learning centre. We feel they will be useful as aids during the first steps in the development process.

### 3.1 Towards a pattern language for the organisational design of e-learning centres

In Figure 7 below, we offer a representation of key aspects in implementing an e-learning centre. We present this as a 'root' pattern later in this booklet. We have identified four key purposes for an e-learning centre that might be distinctive to a centre (ie its sole purpose) or particular orientations within a multi-purpose centre. We present patterns for each of these purposes. Next, for each purpose or orientation, we need to consider the following areas of concern: (i) the services and activities undertaken; (ii) the resources needed, both physical and human; (iii) the administration and management of the centre; and (iv) the quality assurance mechanisms needed for the smooth and effective operation of the centre. We have focused in this booklet on presenting patterns for the *support or service purposes* of an e-learning centre. So you will find below a set of patterns that look at: (a) the services or activities; (b) the resources; (c) the administration; and (d) the quality assurance mechanisms for a support or service role orientation of an e-learning centre.

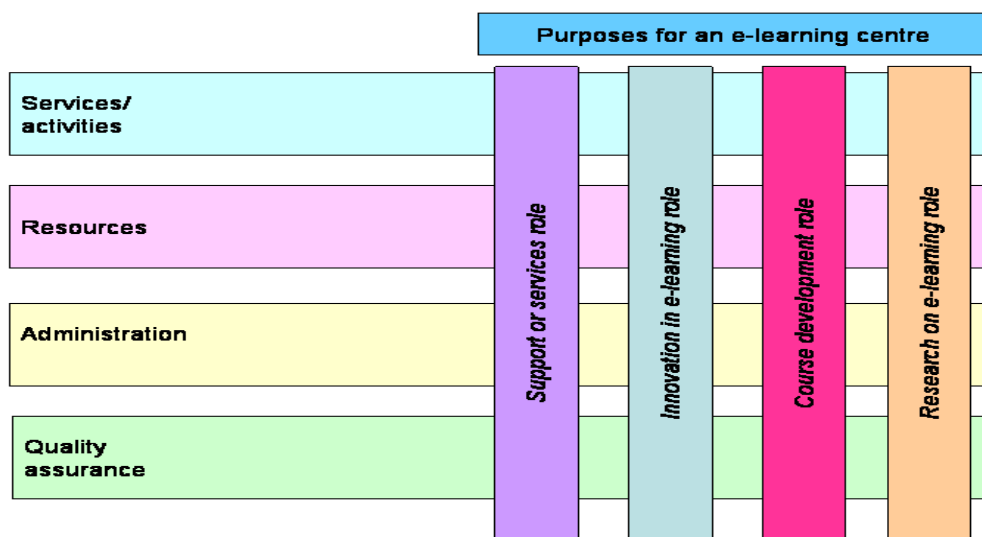
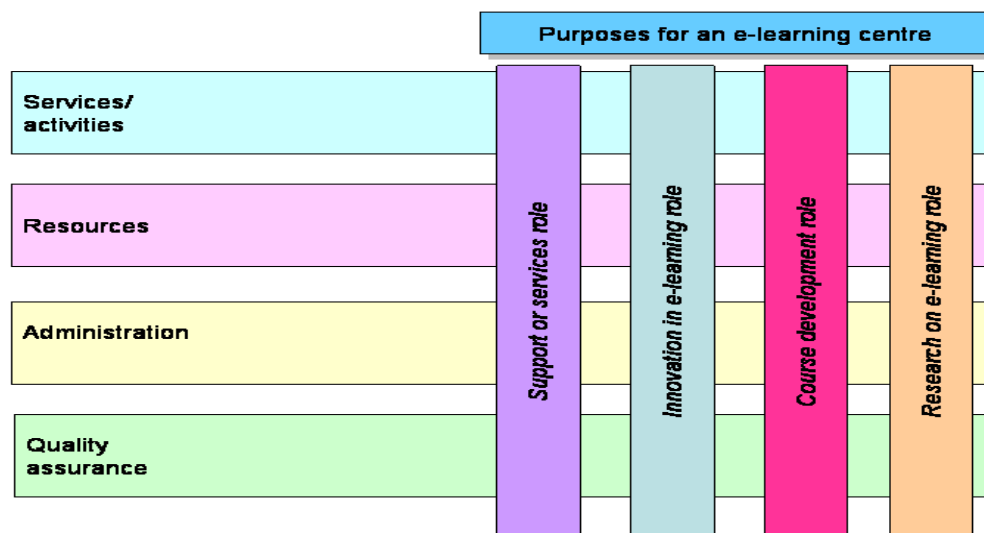


Figure 7: a schematic representation of a pattern language for e-learning centre implementation

### 3.2 A pattern for potential e-learning purposes

Figure 8 below represents this root pattern for an e-learning centre. The e-learning centre survey conducted earlier in the E-LEN project work has been used to inform this pattern.



**Figure 8: a schematic representation of the root pattern for an e-learning centre**

NAME: An e-learning centre pattern

CONTEXT: Strategy for e-learning

PROBLEM: There is a need for universities and other learning institutions and organisations to develop, implement and evaluate the use of innovative computer technology in teaching and learning in order to keep up with the changing needs of the modern society and to maintain a high profile in the market area.

ANALYSIS: Universities and other organisations need advice on how to set up a unit or centre for serving the learning needs of students, faculty and staff, for the deployment of pedagogically informed state-of-the art technology in courses and for the development of new learning technologies guided by theory and validated by observation of practice.

SOLUTION: The solution seeks to address the following orientations of e-learning centres which point to the various activities and roles that an e-learning centre may undertake: a) a support or service e-learning centre, b) a support of innovation in e-learning centre, c) an e-learning course development centre and d) an e-learning research centre. It is possible for an e-learning centre to function by meeting the characteristics of one or more of orientations described below.

*A support or service e-learning centre:* This centre aims to enhance the instructional process and support teaching through working with subject specialists to design and set in place the e-learning infrastructure for a course. It has a responsibility for providing e-learning tools, resources and information and it offers advice and assistance on a one-to-one and on a departmental basis. These activities are enhanced by training academic staff on using e-learning, taking innovative examples of e-learning across the institution and promoting good practice.

*A support of innovation in e-learning centre:* This centre aims to innovate the instructional process through working with faculty co-ordinators to develop efficient virtual learning environments and integrate them into teaching and learning. This is facilitated by direct training of staff in using learning technologies. As part of its role in encouraging innovative use of technology in a variety of university settings it provides pedagogic and technical solutions and helps build next generation learning tools and services for its core residential and extended education environment. Research and evaluation are key and even integrated parts of these activities.

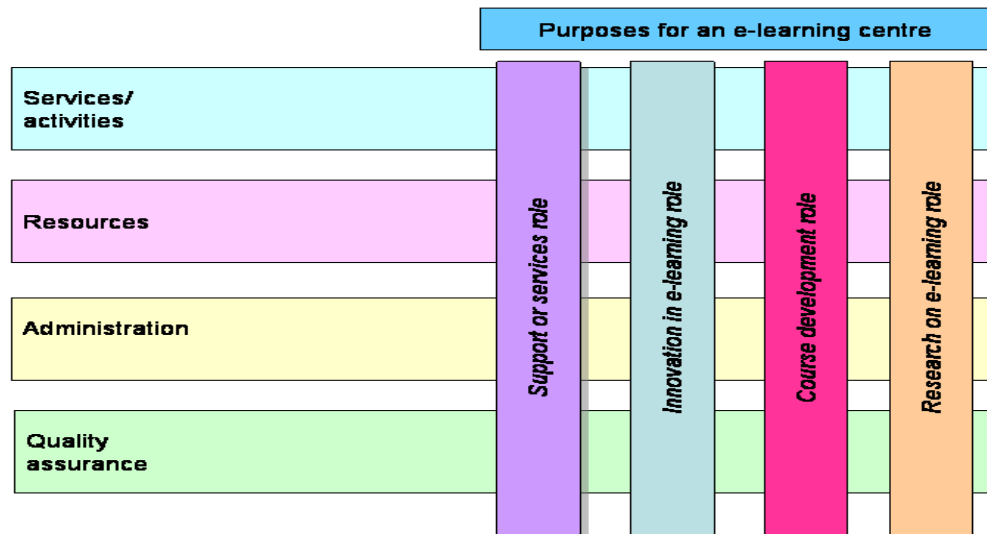
*An e-learning course development centre:* This centre aims to develop and deliver courses online within and possibly outwith the institution. As part of its activities it produces teaching materials for courses as part of developing learning events for geographically dispersed students. The centre's work is informed by the qualities of open and distance education: namely flexibility, learner autonomy and self-directed learning. The centre has a research element in terms of developing new methods and materials while keeping up with technological developments.

*An e-learning research centre:* This centre has research and evaluation of impact of new media in education and integration of e-learning in curricula in the foreground of its mission. It aims to produce new knowledge and define requirements for best learning practices and individualised learning approaches to help universities maintain leadership positions. Work in the centre is organised around a number of projects that explore the relationship between new technologies and the development of attitudes and investigate the conditions for effective management of e-learning activities.

RELATED PATTERNS: An e-learning support or service centre; A support of innovation in e-learning centre; An e-learning course development centre; A e-learning research centre.

We next present a set of four patterns that have been developed around the four orientations for an e-learning centre.

### 3.2.1 A patterns for a support orientation e-learning centres



**Figure 9: a representation of the support or service role orientation pattern**

NAME: An e-learning centre having a support or service role in e-learning teaching and learning

CONTEXT: purposes for an e-learning centre

PROBLEM: Institutions of higher education wish to set up support services as a centre to support academic staff across the institution in their deployment of e-learning for qualitative enhancement of teaching and learning.

ANALYSIS: Institutions of higher education need advice about eg: best ways to set up an e-learning centre; about the resourcing needs; where the centre should be placed in the institutional infrastructure; what kinds of staff are needed and with what skills; and ways to organise and prioritise the centre's work. The design effort should focus on the creation of organisational forms for e-learning centres which favour the emergence of convivial working relationships both within and outwith the e-learning centre.

SOLUTION: The solution seeks to address the following aspects: vision, risk assessment, educational principles, infrastructure, infostructure, support services, budget and resources, a research and development framework, and benchmarking

*Vision:* The centre's vision needs to create alignment between pedagogy and technology but also to interface with research in e-learning. This kind of e-learning centre has the enhancement of the instructional process within the institution as central to its goals. This includes that the staff of this kind of centre will normally work with subjects specialists to design and set in place the e-learning infrastructure for a course. This infrastructure includes eg learning materials, study guides, specifications for individual and group learning tasks and the various ICT tools needed by the learners and their teachers. In this kind of e-learning centre, a broad range of skills is required among staff in order to achieve the centre's aims and objectives. For students the centre's activities can help support flexible patterns of learning such as increasing support to part-time learners; encouraging learners to work more independently and to be more creative; and for widening access to resources.

If the centre's work is to be exciting, stimulating and forward-looking, it is important not to use technology simply as a substitute media for traditional teaching and learning functions. To do so would be to miss the opportunity presented by technology for new kinds of teaching and learning support. There is need to pedagogically re-engineer courses to take account of new characteristics when



technology is used and related learner needs. For example, the use of technology provides the centre with the ability to support teaching and learning operating both on- and off-campus and for academic programmes to reach geographically dispersed beneficiaries.

*Risk assessment:* Attention must be paid to the likely pressures on centre staff of how best to use their limited time and meet the increasing demands for their services. All centres of this kind will be under pressure to demonstrate that they are meeting the aims and objectives of the centre especially to meet the demands from academic staff to develop and support them in running e-learning courses. Centre staff need to be aware of the mismatches in, or unrealistic, expectations as more academics want to make use of e-learning. There is also need to encourage a sense of ownership for, and commitment to, e-learning developments especially at the faculty and departmental levels. The growth and increase in activities can also lead to an increase in immediate but primarily technical kind of problems, often requiring immediate responses. Centre staff need to be aware of the very real danger of them becoming a technical help desk service. Mechanisms for keeping up with technological developments must also be considered. Centre leaders also need incentives to keep centre staff with scarce skills in place, also suggesting the need to pull skills together so that centre staff can cover for each other. Funding resources are typically allocated in time-limited ways to e-learning centres eg, by placing centre staff on fixed term contracts and this will need to be considered. Evaluation of the centre's work needs to consider the wider contextual factors influencing take-up and sustained development of e-learning.

*Educational principles:* An e-learning centre needs to have a clear pedagogical framework that identifies and specifies the philosophical beliefs and values that underpin all aspects of the centre's work and development activities. The centre team need to be able to identify common values and beliefs eg about learning, in order to take a principled approach to their design and support of e-learning. This will encourage building good pedagogy into all design and development processes (Steeple, Jones & Goodyear, 2002) and foregrounds the need for systematic attention to pedagogical issues in design of e-learning.

It is typical that academic staff will initiate much of this kind of centre's work, that is, the centre's activities are often determined by users or 'bottom-up' driven. Much of the centre's staff time is likely to be spent on one-to-one consultancy work in developing applications and learning resources through collaborative projects with academic staff and helping staff in using ICT tools for teaching and learning purposes. The centre is central in encouraging academics to be more creative in their teaching and in finding ways to inspire learners and improve teaching quality. Other academic-related activities are likely to include staff development work including running e-learning workshops and away days on the use of learning technology with some evaluation work of existing applications also likely. It is likely that the major part of a centre's work is primarily organised around projects, which could be funded through a 'competitive proposal process'. Such a process can be useful to help the centre prioritise its actions and to signal its role in selective, quality development activity.

A key role of an e-learning centre must be to support the development of e-learning skills in institutional staff. In particular, the development of staff skills in facilitation and management of online learning environments is essential. There is also a need to develop student skills in learning to learn in less passive and more interactive ways. The e-learning centre can assist learners and academic staff by providing the necessary guidance and support. Specialist skills and expertise are also clearly needed among the staff working within the e-learning centre. There are dangers in individual staff developing highly specialised skills and knowledge especially among a small e-learning centre team. Staff with skills and understanding that bridge between pedagogical and technological areas are likely to be the most valued.

*Infrastructure:* An institutional strategy for e-learning is critical and this pattern needs to be carefully aligned to such a strategy.

Centre staff will need clear lines of reporting and the centre needs to have a clear and appropriate place within the institutional structures. Indeed, there needs to be a sense of fit with the institutional culture and with its teaching and learning strategy. A strategic approach is essential to ensure e-learning has the best possible chance to succeed. While many HE institutions have a strategy for teaching and learning in place, the extent to which they take account of learning mediated through

technology has been mostly more piecemeal. An e-learning strategy is needed to give a forward vision for the institution, to help internal collaboration and to help align pedagogical, business and organisational processes (Ford *et al*, 1996).

Senior managers must be centrally involved in the development of an e-learning strategy and in the implementation of an e-learning centre. Senior management can promote the purposes and work of an e-learning centre to help give it a high profile within the institution. Senior management need to grasp the significance of developing and using technologies for teaching and learning. Integral to an institutional e-learning strategy is the need for an institutional infrastructure to be in place, allowing students and tutors to readily access electronic resources and support. The institutional e-learning strategy also needs to align organisational structures to centrally locate the e-learning centre, particularly in terms of its management, reporting mechanisms and quality assurance processes. Centre staff need to be aware of likely user perceptions, eg that an e-learning centre will have a technological focus rather than a pedagogical one. The organisational location of the centre and the line management is influential in this regard.

*Infostructure:* Systematic production and project management processes are critical within the centre, to ensure complex e-learning developments are properly funded and not under-resourced. This is especially true of expensive multimedia projects that commonly take much longer than anticipated. It is important that the e-learning centre activities are not trapped or bounded within limiting projects. There is a danger in staff spending their time on small-scale developments with no planning for the longer-term use of learning technologies beyond the funding period. This will diminish the opportunities for embedding and sustaining the development and for creating possibilities for reuse and adaptation to other teaching and learning situations across the institution

*Support services:* The centre needs to have links and working relations with associated support services to ensure consistency, current awareness and the smooth integration of services and functions across the institution eg linking into student support and management services including eg registration processes, as well as to the library, staff development and audio-visual services, etc.

*Budget and resources:* The centre requires a start-up budget including to cover for capital expenditure. It will also need an annual budget for both staffing and resources, which may be derived from top slicing across the institution. Many centres are initially allocated funding for a limited period during which the institution monitors the success and impact of the centre's work, before committing to long-term support, particularly in creating permanent posts for staff.

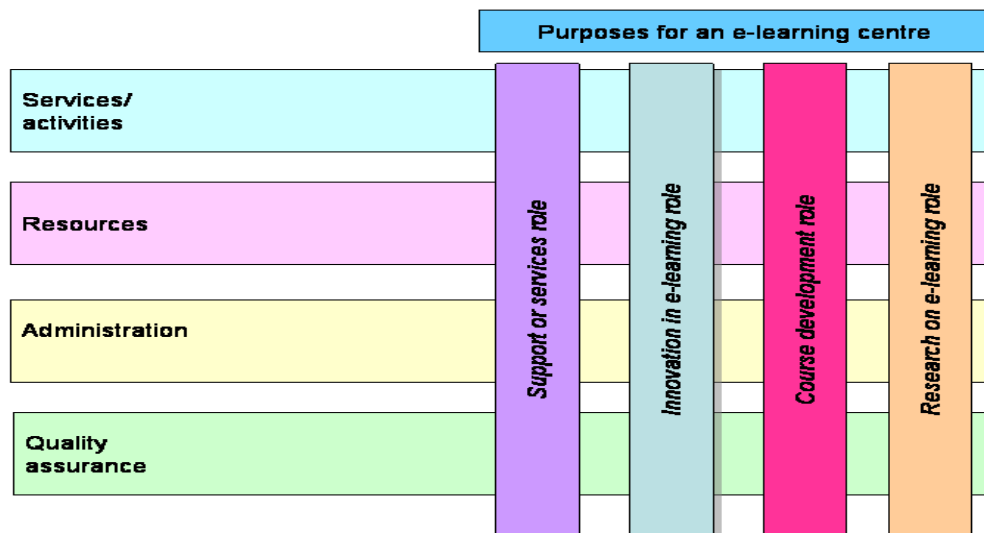
*R&D framework:* It is important to note that while this kind of e-learning centre may have research as part of its activities, the research orientation is not in the foreground of its mission. However, '*research is necessary to remain current and innovative ... a research framework is imperative and must be built upon how people learn, how new tools support and assist learning goals and what ... organisational structures support these gains*' (Garrison & Anderson, p108)

*Benchmarking:* Consistency in the quality of support across all users of the e-learning centre with the systematic handling of queries is likely to be a real and ongoing challenge. The systematisation of work processes, allowing tracking of progress and tracking of resources is suggested. All work processes need to be designed to meet minimum quality standards and to help streamline administrative processes. An annual review and evaluation of the centre's achievements is also recommended: to monitor progress and the meeting of strategic goals.

RELATED PATTERNS: Services and activities; resources; administration; quality assurance

### 3.2.2 An innovation in e-learning orientation pattern

This next pattern focuses on the innovation in e-learning purpose of an e-learning centre.



**Figure 10: a representation of the innovation in e-learning role of an e-learning centre pattern**

**NAME:** An e-learning centre having an innovation in e-learning role

**CONTEXT:** purposes for an e-learning centre

**PROBLEM:** Institutions in higher education need to set up centres to promote innovation in the instructional process where putting e-learning at the core of their practices is central.

**ANALYSIS:** Institutions of higher education need advice about eg: best ways to set up an e-learning centre; about the resourcing needs; where the centre should be placed in the institutional infrastructure; what kinds of staff are needed and with what skills; and ways to organise and prioritise the centre's work. The design effort should focus on the creation of organisational forms for e-learning centres which favour the emergence of convivial working relationships both within and outwith the e-learning centre.

When the centre's purpose is to support and help create innovation in e-learning, the centre needs to operate in proactive, creative and innovative ways, eg by drawing upon contemporary research and sound educational practices. Awareness of this will need to be reflected in the interpretation of this design pattern.

**SOLUTION:** The solution seeks to address the following aspects: vision, risk assessment, educational principles, infrastructure, infostructure, support services, budget and resources, a research and development framework and benchmarking.

*Vision:* The centre's vision needs to embed e-learning across the institution and support innovation through the development of learning technologies informed by sound pedagogical theory. As part of promoting innovation in the instructional process, the e-learning centre may provide new technological tools that can support innovative forms of teaching and learning e.g. virtual environments to offer flexible study and online communities to connect and engage with other learners. Such developments may enhance collaboration and promote genuine forms of learning such as learner autonomy and

reflective study (Zenios, Banks & Moon 2004). The centre's products and related resources need to be promoted across in order to enhance sustainable e-learning. The staff of this kind of centre needs to support academic staff in the implementation of e-learning environments and related technologies and monitor the steps faculties take in using technology through evaluation. An important aspect of the centre's work is research through participation in project work with national and international projects. A broad range of skills from technical to pedagogical and managerial are essential for staff and above all team work is required to bring the various skills together towards the development of learning technologies.

*Risk assessment:* If the centre's developments and products are to be successful it is important to take account of new technology characteristics and related learner needs while developing e-learning events. A primary challenge that the centre may face would be in explaining the pedagogical benefit in using technology across faculties. Attention must be also paid while dealing with variation in demand within faculties for the centre's support and range of services. The centre might be called to identify appropriate technologies for different subject areas in collaboration with related staff. In general, the centre will have play a leading role in re-building curricula in order to integrate e-learning into the institutions's mainstream educational support. Innovative educational issues to consider at faculty level is the development of cross-disciplinary communities of practice and tools that support processes of knowledge development.

A sound business case is required for embedding e-learning across the institution and for sustaining the e-learning centre.

*Educational Principles:* An e-learning centre needs to adopt a clear pedagogical framework based on contemporary theories of learning to identify philosophical beliefs and values underlying all centre activity. Pedagogic issues generally need to be addressed in design of e-learning and all partners involved in the process should share the same pedagogical values. A key role for the centre staff is the development of e-learning skills across faculties by running induction programmes and technical training sessions for academic staff.

*Infrastructure:* An e-learning strategy is needed to help align pedagogical, business and organisational processes (Ford *et al*, 1996). Strategic actions that address issues of culture, leadership, organisation and change are particularly important for this type of centre which aims to have a central role in integrating e-learning within the curriculum. Towards that end, senior managers must be centrally involved in the development of the strategy to help give it a high profile within the institution and facilitate implementation and take-up of e-learning across faculties. Ownership of the innovative developments by senior managers and other stakeholders is an important aspect of the strategy that will enable engagement with e-learning. This type of centre also needs to have clear organisational structures in place both within the centre itself and in relation with each faculty while leading discussions in the area of e-learning.

*Infostructure:* Design of e-learning initiatives in this kind of e-learning centre is organised around projects. A suggested way to manage and support systematic production and to enhance re-usability is logic theory. This can help project teams articulate their implicit theories about learning and change, a process useful in improving educational impact (Zenios, Goodyear & Jones, 2004). The e-learning project team needs to carefully consider from the a) the intended benefits of their projects; b) the people who they expect would turn their outputs into real educational benefits and the actions these people would take to achieve these benefits; and c) the ways in which they might work in order to involve these people in a timely and sustainable fashion. These issues need to be considered from the beginning through to the end of the project using the emerging information to construct logic tables showing the linkages between project activities, outputs ie products and services, beneficiaries reached and outcomes, such as changes or benefits for learners. Understanding the interconnection between these elements may help towards a better planning of integration between resources and learner activity.

*Support services:* The centre needs to work in close liaison with other support and service teams e.g. library, ICT service centre, educational development and research group to ensure smooth integration of services across the institution.

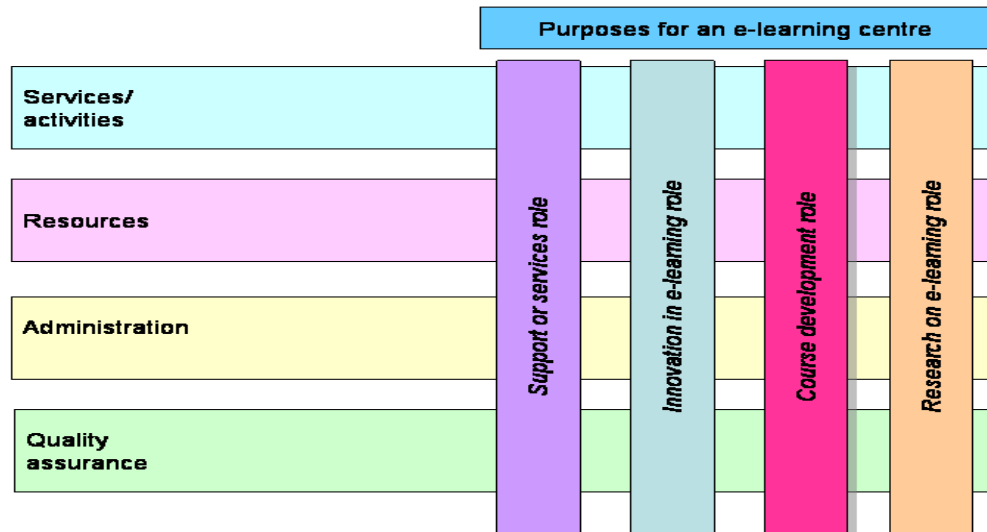
*Budget and resources:* This type of e-learning centre needs to be funded by the institution through regular annual budget although it might be able to finance further developments through re-investing in their own products.

*R&D framework:* Research has a central role in this type of centre's work being related to the curricula of the different faculties and guiding best practice. In that sense, research work needs to be oriented towards bridging the gap between theory and practice in the area of e-learning. The research and evaluation should be organised around participation in long-term international projects

*Benchmarking:* In order for the e-learning innovation to be successful, there is a need to establish success criteria and to assess progress as to the implementation of e-learning into the curriculum.

RELATED PATTERNS: Services and activities; resources; administration; quality assurance

### 3.2.3 Pattern for an e-learning course development role for an e-learning centre



**Figure 11: a representation of the course development role of an e-learning centre pattern**

NAME: An e-learning course development centre

CONTEXT: purposes for an e-learning centre

PROBLEM: Institutions in higher education need to set up centres to promote open and distance forms of learning through designing and delivering courses on-line to reach geographically dispersed students.

ANALYSIS: Institutions of higher education need advice about eg: best ways to set up an e-learning centre; about the resourcing needs; where the centre should be placed in the institutional infrastructure; what kinds of staff are needed and with what skills; and ways to organise and prioritise the centre's work. The design effort should focus on the creation of organisational forms for e-learning centres which favour the emergence of convivial working relationships both within and outwith the e-learning centre.

When the centre's main purpose is course development, then the design of the centre needs to recognise this role in its development. This means the design needs to reflect and accommodate the fact that the centre will be involved, in its day-to-day working, in course development and production processes.

SOLUTION: The solution seeks to address the following aspects: vision, risk assessment, educational principles, infrastructure, infostructure, support services, budget and resources, a research and development framework and benchmarking.

*Vision:* The centre's vision needs to develop flexible forms of learning support through the development of courses online. This includes that the staff of this kind of e-learning centre will normally work collaboratively to prepare content and produce teaching materials for a course as part of developing learning events for geographically dispersed students. It is important to develop advanced technologies such as streaming video for illustration and story telling, to integrate with the learning resources for enhancing flexibility. In addition, staff would have to run a portal with available courses and to support students i.e. through providing feedback on their work. As part of these activities, the e-learning centre needs to develop an online system for support for learners and tutors to include catalogue services, student registration, administration of student progress, and administration of exams. A broad range of

skills are required for staff including sound technical expertise, good pedagogical skills as well as managerial. For students' the centre's activities can help support flexible patterns of learning such as increasing support to part-time learners and for widening access to resources.

*Risk assessment:* This type of centre is expected to face increasing competition, therefore it is necessary to take account of new technology characteristics and related learner needs while developing e-learning events, in order to remain a leading provider in the field. A marketing strategy group trying to find ways of advertising and spreading knowledge about courses offered will be needed to address this challenge. Most importantly, in their efforts to establish themselves as leading centres in distance education these types of centre need to pay attention to integrating pedagogy in course design and implementation and not simply using state-of-the-art learning technology as a substitute for traditional and face-to-face teaching.

*Educational Principles:* The centre's work needs to be informed by the qualities of open and distance education: these being flexibility, autonomy and self-directed learning, allowing learners to take responsibility for their own progress i.e. studying modules for self-study structured after normal progression. Pedagogic issues need to be addressed in design of e-learning courses aiming to enhance active collaborative learning through the use of advanced technology. A core value in this type of centre's work is likely to be in supporting life-long learning and offering flexibility in meeting student needs.

*Infrastructure:* A step to enhance existing strategy may include ownership of e-learning developments by stakeholders in order to increase commitment in e-learning. The development of the centre needs to be carefully aligned to the institutional e-learning strategy as well as to administrative and organisational structures.

*Infostructure:* Systematic production is critical within the centre in order to sustain development and allow re-use and adaptation of resources. The processes and techniques used in course development activity need to be documented where possible so that they can be used for developmental purposes as well as for monitoring progress and for adaptation and/or reuse for new purposes.

*Support services:* This kind of e-learning centre needs to work closely with related faculties that may offer advanced technical support to develop courses, certificates and other programmes of study. The centre also needs to work in close liaison with other support and service teams eg with the library, media resource centre and student registration functions.

*Budget and resources:* The centre might be funded by public and/or private sources eg utilising fees from companies who have interest in the centre's expertise. The ongoing costs for course developing, running and marketing is likely to be covered from student fees. This type of centre would have to look for demand from potential user groups, trends in the market and among the current users and students when it comes to developing new courses.

*R&D framework:* Although, research orientation may not be in the foreground of this type of centre's mission it needs to have research as part of its activities. Research in that respect needs to be oriented towards keeping up with the latest technological developments while meeting students' needs.

The courses are updated each semester to capture the latest technology and to reflect the change in student needs. Research has a central role in this type of centre's work being related to the curricula of the different faculties and guiding best practice. In that sense, research work needs to be oriented towards bridging the gap between theory and practice in the area of e-learning. The research and evaluation activities of the centre could also be organised around participation in long-term international projects.

*Benchmarking:* In order for the e-learning provision to be successful, there is a need to establish success criteria for the online courses and to assess progress as to the pedagogical benefit for students. Course content materials should be updated following evaluation processes, informed by student feedback and internal discussion with stakeholders involved ie managers, tutors, developers, researchers etc.

RELATED PATTERNS: Services and activities; resources, administration; quality assurance

### 3.2.4 A pattern for a research on e-learning orientation to an e-learning centre

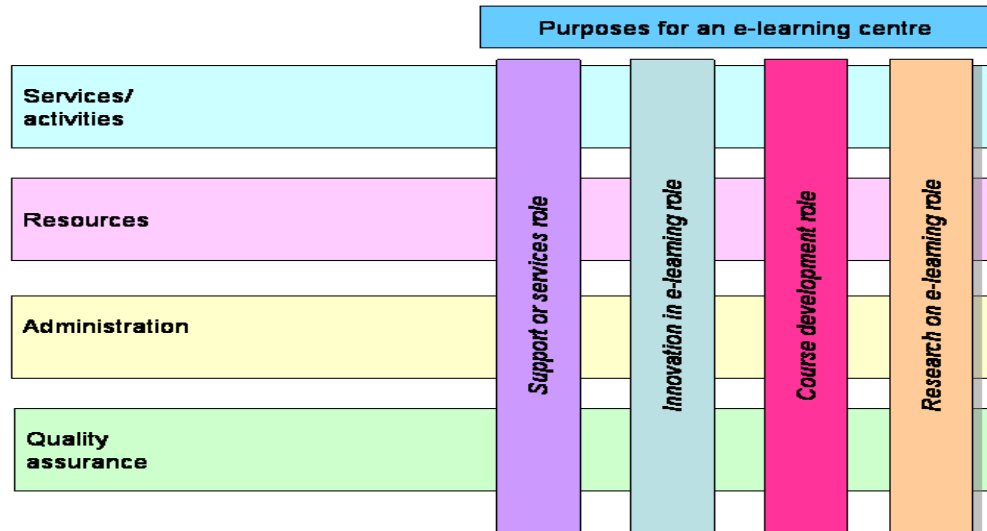


Figure 12 – a representation of the research orientation of an e-learning centre

NAME: A research role e-learning centre

CONTEXT: purposes for an e-learning centre

PROBLEM: Institutions of higher education need to set up centres geared to conduct research in the area of e-learning, aiming to produce new knowledge and define requirements for best learning practices and individualised learning approaches to help universities maintain leadership positions.

ANALYSIS: Institutions of higher education need advice about eg: best ways to set up an e-learning centre able to support related research activities ie understanding the conditions to develop and manage effective e-learning experiences; about the physical and human resources needed; the location of the centre within the institutional infrastructure; and ways to organise and prioritise research projects and other activities undertaken. The design effort should focus on the creation of organisational forms of e-learning centres which forge links within and outwith the centre and disseminate new information in regard to e-learning experiences.

SOLUTION: The solution needs to address the following aspects: vision, risk assessment, educational principles, infrastructure, infostructure, support services, budget and resources, a research and development framework and benchmarking.

*Vision:* The centre's vision would be to produce new knowledge for pedagogically effective uses of e-learning developments and define requirements for best learning practices. This includes that staff of this kind of e-learning centre will normally work on a number of research projects exploring the relationship between new technologies and the development of attitudes, as well as investigating the conditions for effective management of e-learning activities.

For this type of centre to have an impact on e-learning developments there is a need to assist effective deployment of learning technologies across university departments and work towards developing end-user's skills, including students, as part of their technological and e-learning developments.



*Risk Assessment:* If the centre's developments are to be successful there needs to be close communication with senior managers across university departments. The centre needs to convince heads of departments and course designers to make the use of technology as an integral part of their design and adopt appropriate technologies and pedagogies to promote changes. There might be a danger for the centre's research outputs not being taken up by departments and have little effect on teaching and learning practices. To achieve their aims, centres need to generate a professional workforce ie train academic staff and students and prepare them for the changing needs of the institution.

*Educational Principles:* The centre needs a clear pedagogical framework moving away from transmissive models of learning to individualised learning approaches emphasising autonomy and learner-centredness. These qualities can be enhanced through developing and evaluating innovative tools and assessing the impact of new media in education. The centre's activities need to be organised around that framework and may include integrating audio-video sources in e-learning activities to assist teaching, consultation services and support for implementation and assessment of e-learning processes in higher education institutions and professional environments.

*Infrastructure:* The centre needs to promote an e-learning strategy that touches every learner within the institution and beyond, aiming to influence national committees and professional bodies. This strategy needs to be unified across the whole institution to ensure e-learning has the best possible chance to succeed. In addition the centre needs to effectively disseminate its outputs to the outside world and put effort towards maintaining a high profile within the national and international e-learning arena. Integral to an e-learning strategy is the need for a technical infrastructure in place to enable access to resources and connections between learners.

*Infostructure:* A research role e-learning centre is likely to organise its activities around large projects. Systematic work and management of resources is needed to ensure re-use and adaptation of new media. Logic theory is suggested as a means to improve educational impact through articulating implicit theories of learning and change (Zenios, Goodyear and Jones, 2004). Following that method for each working project its team needs to work towards making the linkages between their outcomes ie tools, guidelines, reports etc, their beneficiaries and their intended long-term benefits for teaching and learning. Understanding these interconnections may help towards a better planning of integration between resources and learning practice.

*Support Services:* Apart from the institutional support services i.e. library, ICT and staff services, the centre needs to forge strong links with private companies and connect with other e-learning research communities.

*Budget and resources:* This type of centre could benefit from long-term support but it will have to fund its initiatives through national and international funding organisations.

*Research and development framework:* The centre's purposes need to be clearly projected to the outside world to encourage further research and evaluation through international collaborations. The centre will wish to create networked partnerships with other organisations to share e-learning tools and resources and develop good practice. There needs to be an active seeking of research opportunities.

*Benchmarking:* The centre needs to assess progress as to the quality and educational usefulness of activities and tools developed. Evaluation will need to be an integral part of the centre's activities.

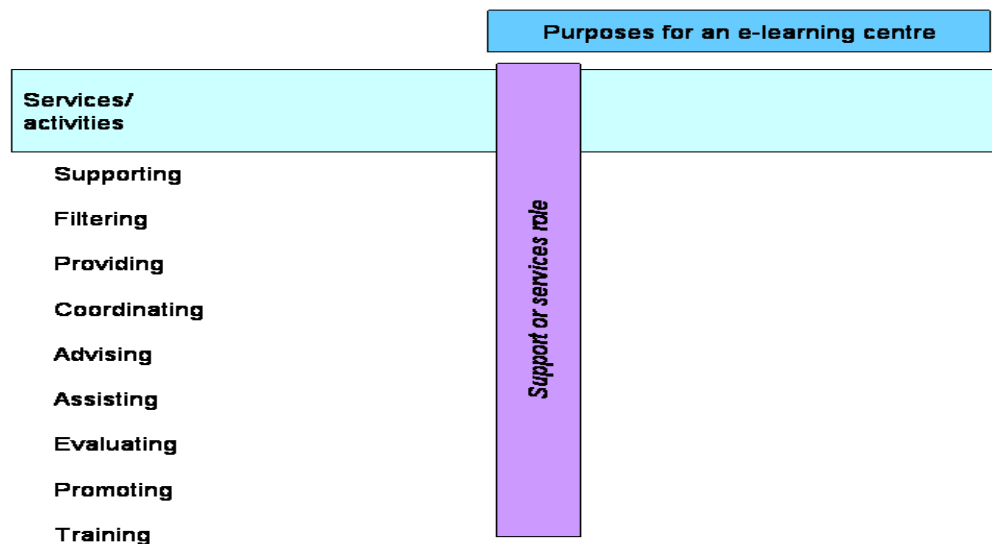
RELATED PATTERNS: services and activities; resources; administration; quality assurance

### 3.3 Patterns within a support or service role orientation e-learning centre

In this section of the patterns, we now move down to a lower level of patterns for e-learning centres. We cover the four influences upon an e-learning centre purpose (ie the services and activities, the human and physical resources, the organisation or administration and the Quality Assurance mechanisms). In this booklet we present only the patterns for these four influences as they relate to an e-learning centre with a service or support role orientation.

The first pattern to look at concerns the services and activities for a support role e-learning centre.

#### 3.3.1 A pattern for services and activities in a service or support role orientation to an e-learning centre



**Figure 13: A representation of the pattern for services and activities in a service or support role**

**NAME:** services and activities offered by a support or service orientation e-learning centre

**CONTEXT:** support or service orientation

**PROBLEM:** e-learning centres established within institutions need to provide a range of activities and services and to undertake specific activities to promote e-learning, having a clear pedagogical orientation. They need to examine the range of services offered and determine how best to allocate resources to optimise the use of the centre and to maximise the positive impact of the centre on take-up and sustained development and use of e-learning across the institution.

**ANALYSIS:** services offered need to address staff needs in enhancing the learning processes through providing appropriate tools and materials, promoting use of learning technology and facilitating research and evaluation activities, and extending the skills of staff in relation to e-learning.

**SOLUTION:** The following elements are considered: vision; risk assessment and educational activities.

*Vision:* A support or service role e-learning centre will wish to operate its services and activities in effective and optimal ways. The centre needs to recognise the range of services and activities it can offer and organise these in ways that give the maximum benefit to the maximum number of users. It will

also wish to see its services and activities as offering 'added value' ie making a qualitatively positive difference to the support of teaching and learning eg in widening access; supporting flexibility and more learner-centred approaches to teaching and learning; and in encouraging academic staff to design learning solutions that are relevant, creative but also contemporary and engaging for learners. The centre also needs to cultivate enthusiastic 'champions' of e-learning across the institution.

*Risk assessment:* Support and service kinds of e-learning centres are typically over-worked and can become bogged down in complex developments and over-running projects. The staff need to develop mechanisms to prioritise their actions as well as to monitor and assess progress, to streamline administrative processes and to coordinate the centre staff activities. The staff in the centre need to be able to prioritise and be selective in the work undertaken not just reactive to immediate and most visible demands upon their time. They need to be able to manage projects. They need to have contact to senior management with influence for policy on e-learning. They centre needs to consider security of its staff and the longer term impacts of its activities. It needs to organise work to lead to sustained development, not quick-fix solutions that are too often not reusable or adaptable to other situations. E-learning centre staff need constantly to be looking for adaptability and reusability opportunities.

*Educational activities:* The purposes of an e-learning centre offering a support or service role can be described by using the following verbs: support, provide, advise, assist, promote, filter, and train. We briefly outline each of these activities below:

*Support* is used to describe support of the instructional process or to enhance the teaching and learning provision, as well as support of the institutionally chosen virtual learning environment (VLE)

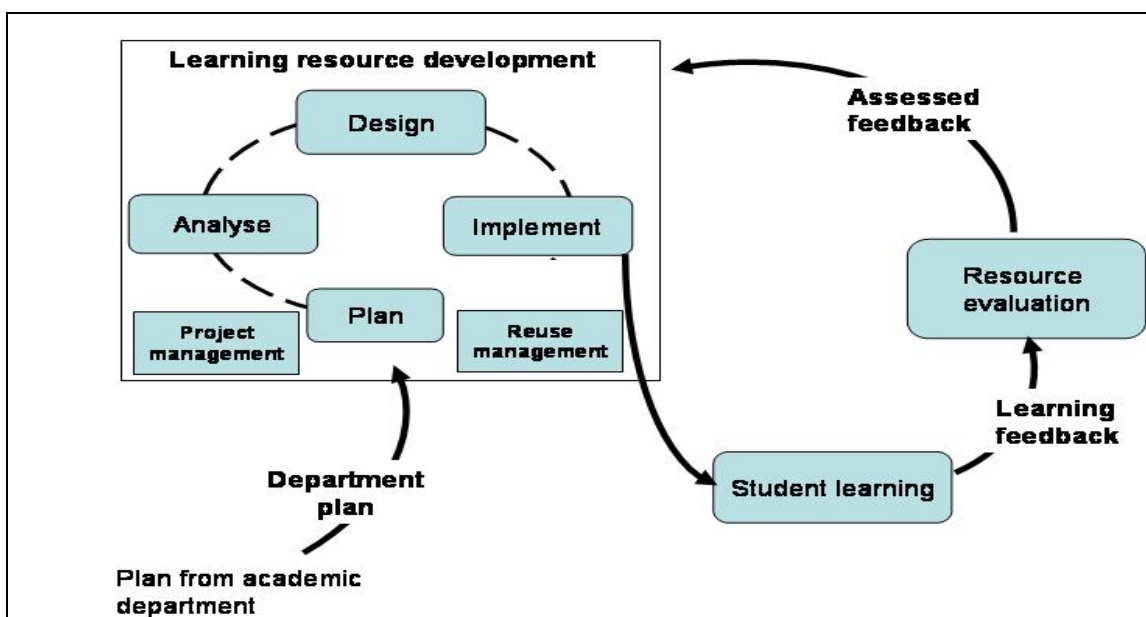
*Filter* is used to describe the centre's role in acting as a lens through which to filter research news and dissemination of e-learning research. Academic staff will want to know about new developments but probably only in so far as they are useful to them and their subject area.

*Provision* is used to describe the provision of eg tools, resources and any information relating to e-learning: including VLE provision, training materials, study guides, access to resources and applications eg in demo lab, journals and books, etc

*Coordinate* concerns the centre's connections with other agencies and in helping academics eg many have found that the best way to help academic staff integrate technology into their teaching practices is to ask teachers with expertise in technology to mentor others in the use of learning technology tools. These teachers may be assigned to work alongside e-learning centre staff on a specific or range of e-learning projects, particularly linked to the academic's subject area. Coordination may also occur where there are complementary e-learning staff placed within schools or faculties who's work is aligned with central e-learning staff activities

*Advise* is used to describe the advice given to academic staff on a one-to-one and on a departmental basis eg in departmental development events, such as workshops and training days. Also to students eg on the technical aspects of using the institutional VLE

*Assist* is used to describe the assistance given in any aspect of course development in which e-learning is a part. It also involves assisting in the design and development of courses, modules and programmes in conjunction with academic staff and other support agencies eg the library. This assistance might be, for example, in a blended learning course in which a traditional face-to-face approach is enhanced by use of an online environment to enable extended discussions and to provide continuous access to course documentation. Assistance can be a major part of the centre staff's activities.



**Figure 14: the learning resource development process**

Figure 14 (above) gives a diagrammatic representation of the learning resource development process in a typical e-learning centre. Projects for development eg of learning resources for courses, modules or programmes are often initiated by an enthusiastic member of the academic staff and taking it to the e-learning centre for development support. The development cycle is iterative but involves taking an outline plan, conducting a needs and requirements analysis, leading to development of a design. The design is next produced and implemented and should lead to student learning, from which feedback can be gathered to evaluate the resource. Assessed feedback further informs the team on the success or otherwise of the resource. The evaluation findings can be fed back to the e-learning centre to inform future development work.

*Evaluate* concerns the centre's role in examining generic products before recommendation to eg depts or subject areas, as well as its role in evaluation of development projects eg to assess usability, impact and learning outcomes.

*Promote* is used to describe how the centre promotes good practice by reporting on successes, promoting the use of learning technology, eg through the use of flyers and newsletters, to give information on innovative examples of e-learning to staff across the institution.

*Train* is used to describe the training provided by the centre eg in use of an institutional VLE, but also the training provided as part of an institutional programme on teaching and learning designed for new academic staff. Staff development workshops will be part of the training provision eg on both pedagogical and technological aspects of e-learning.

The centre staff need to organise their time in order to address this range of activities and to determine the priorities. One possible and typical approach taken by established e-learning centres is to organise the centre's activities around development projects, setting up project teams consisting of e-learning centre staff, academic staff and relevant staff from related support units (eg from information systems staff for technical support or eg library staff for help in accessing digital resources online). Projects will have allocated budgets to cover e-learning centre staff costs and for resources required for the development. Projects can be planned and monitored using project management tools. Projects can be organised as action learning and evaluated by e-learning centre staff and/or independent evaluators to measure effectiveness and from which to learn and improve practice for future e-learning centre work.

The e-learning centre's staff also need to be acting as ambassadors for good practice in e-learning. The centre will also be actively seeking to influence all levels of the institution but especially senior management through contributing to e-learning strategy and policy.

RELATED PATTERNS: patterns for specific activities.

### 3.3.2 A pattern for human and physical resources in a service or support role orientation to an e-learning centre

NAME: human and physical resources needed for a support or service role orientation e-learning centre

CONTEXT: support or service orientation for an e-learning centre

PROBLEM: Support and service role e-learning centres have finite resources and will need to prioritise these to best meet their user needs and to undertake the commitments of the e-learning centre. E-learning centres are a relatively new idea and as such getting staff with the right mix of skills, knowledge and experience can be difficult. E-learning centres are also often set-up initially in limited ways ie in terms of funding period for staffing and budget for resources that can constrain the centre's range and scale of activities.

ANALYSIS: Staff in the e-learning centre will be under pressure with competing demands upon their time. Resources need to be carefully chosen and allocated to best meet needs (both now and emerging). Provision for change and for development needs to be at the heart of all areas of resource planning.

SOLUTION: This is presented in two parts: (i) concerning human resources, including skills and roles for staff and (ii) concerning physical resources and the physical set-up of the centre

In terms of staffing we can look at the kinds of activities undertaken and skills needed by e-learning centre staff working in a support and service orientation e-learning centre. We draw here upon the work of Oliver *et al* (2004) for identification of the following nine kinds of roles of e-learning centre staff:

1. Providing pedagogic advice, guidance, encouragement and support on the use of technology to staff involved in teaching
2. Actively keeping abreast of developments in learning technologies
3. Facilitating access to expertise, services and resources related to technology supported learning
4. Acting as a consultant, mentor or change agent with other staff within the institution (including academic and administrative staff)
5. Advising and assisting with the introduction of technology-supported learning through workshops, teaching on courses for new lecturers, one-off consultations or through collaborative project work that can be framed as action learning. Such advice typically focuses on educational or organisational issues but may also include technical issues.
6. Undertaking a range of networking activities, such as liaising with other units within the institution that have related interests and objectives, increasing colleague's awareness of existing practice, enabling exchange of ideas and experiences in technology-based learning and teaching
7. Contributing to the development of strategy and policy, for example by providing expert advice, by writing or commenting upon draft documentation, through the identification of needs and opportunities for the development or deployment of learning technologies
8. Drawing upon and contributing to the development of understanding and practice in the field of learning technology through engagement in discussions (formal and informal), conferences, workshops, research and other events at national or international level.

9. Exploring the problems and complexities of practice in order to provide appropriate guidance and advice (Learning Technology involves analysis and grounded enquiry rather than the application of a standardised body of procedures and facts, although this work would be expected to draw upon educational theories and research.)

These nine roles help identify the kinds of skills needed. The roles encompass a diverse and complex range of skills and areas of knowledge that transcend both pedagogical and technological fields, and involve managerial skills in project management and administration, as well as evaluation and research skills.

The staff of an e-learning centre also need more generic skills that include technical, communication and interactive skills, abstract and critical thinking skills, sustained reasoning, the ability to manage complexity, as well as to organise and evaluate information.

E-learning centre staff also need to acquire knowledge and competencies in more mainstream HE or training issues such as on disability, equal opportunities, and ways to support widening participation. They also require promotional and dissemination skills as well as skills in providing leadership in e-learning to the institution. In addition the centre staff will need to participate in continuing professional development to keep their skills and knowledge up-to-date.

In terms of the physical resources for the e-learning centre we will look at the materials and equipment needed as well as the set-up arrangements of the centre itself and its location within the institution.

In terms of materials specifically for e-learning, the centre will need a range of hardware and software for e-learning design, production, use and evaluation. This can include multimedia technologies, and associated hardware and software eg scanners, digital cameras, audio equipment, video editing software and prototyping tools. It also includes bespoke and generic courseware products, all software and hardware requirements for running and maintaining the institutional VLE, as well as communications technology, simulations, and performance support tools.

The centre will also require a range of paper-based resources such as manuals and guides to software and hardware, tools for instructional design such as checklists and evaluation instruments. Paper-based materials also include any books, journals, conference proceedings, or other sources offering both practical advice and research or theoretical principles. The centre will also require access to online bibliographic databases

Other resources and materials will include for management and administration eg for word processing and project management, plus spreadsheet software for budgeting and financial record keeping. The e-learning centre staff will need standard office equipment and materials eg personal computers, telephones, fax, office furniture and equipment eg printer, demonstration equipment including data projector, and possibly multimedia production facilities.

The physical space of the centre needs to be both functional and flexible, given the range of duties of the centre staff. It is highly useful for staff offices or work spaces to be co-located because of working as teams on projects and to create a very real, physical centre. It is quite usual for the centre leader to have a separate office. A group space for collaborative working, demonstration as well as for training events and project meetings is highly desirable. Digital editing facilities and space will be required if the centre is involved in learning materials or learning systems production.

Location of the unit will signal to users the centre's key purposes and underpinning orientation. Many established e-learning centres are placed within a centralised teaching and learning function, indicating the emphasis of all associated units is on supporting learning and teaching (including through the use of technological tools and systems).

**RELATED PATTERNS:** patterns for specific human or physical resources for a service or support role e-learning centre

### 3.3.3 A pattern for e-learning centre organisation

**NAME:** A design pattern for the management, administration and financial organisation of an e-learning centre

**CONTEXT:** E-learning centre design patterns

**PROBLEM:** E-learning centre implementers need to know how to structure and organise an e-learning centre. They need to decide where the centre will fit within the institutional infrastructure, but also how it is best managed, administered and financed.

**ANALYSIS:** Institutions of higher education need advice about best ways to set up an e-learning centre, about the resourcing needs and where the centre should be placed in the institutional infrastructure. The design effort should focus on the creation of organisational forms for e-learning centres which favour the emergence of convivial working relationships both within and outwith the e-learning centre.

**SOLUTION:** Systematic administration and management processes are crucial for the successful implementation and running of an e-learning centre. The solution looks at the following key aspects of these processes: management; organisation of work; use of tools; reporting mechanisms; administration; financing; and alignment to other functions or units.

In terms of management, the centre needs a leader to coordinate the centre team, to oversee its activities, to report to senior management, to provide support and leadership to staff with a range of skills and expertise and to create an effective and clear line management structure.

Staff within the centre can be organised in project teams giving one person responsibility for project management, eg coordinating project resources and project staff. This role can be a rotating one to encourage development of project management skills across the team and for promoting collaborative working.

Staff need to make use of management and administration tools to eg streamline workflow, and to monitor finances.

The centre also needs clear lines for reporting on its work (in both up and down structures) and that cause the centre to be represented fairly on the institutional teaching and learning board or committee. It will also need representation on relevant policy and resources committees and connections to the institutional quality assurance mechanisms. Typical mechanisms are likely to include an annual review and report as well as mechanisms to gather feedback directly from all types of end users.

Staff in the centre will need to develop effective procedures for administration processes, such as the handling and monitoring of enquiries, a systematic programme for staff development or training, procedures for acquiring resources and equipment, as well as for ordering and maintaining office equipment, software, licences and the VLE.

The centre's leader and administrator will need to monitor costs and expenditure. Financial provision plans will be required for all aspects of the centre's work: eg for projects, staffing, training, resources, equipment, professional awareness, dissemination activities, staff development activities, books, software, licences, the VLE. Many established centres receive an annual budget derived from top slice funding across the institution which can then be allocated eg to new project funding allocations, plus costs towards a rolling replacement programme for equipment, and an allocation to cover the costs of the fixed term staff employed within the centre.

All businesses processes for the centre may also be subject to alignment with other central service unit processes.



A steering group is useful for an e-learning centre: to offer advice, to champion for resources and to monitor progress. Steering groups are often set-up to help establish and support a newly implemented e-learning centre,

**RELATED PATTERNS:** specific patterns for administration, management and financial processes

### 3.3.4 A pattern for quality assurance and quality enhancement mechanisms

**NAME:** A design pattern for the quality assurance and quality enhancement of an e-learning centre

**CONTEXT:** E-learning centre design patterns for a support role kind of e-learning centre

**PROBLEM:** E-learning centres need to ensure quality is consistently assured across all aspects of its operation and organisation. It also needs to develop effective mechanisms to monitor performance and to act upon feedback to improve or enhance the centre's service and products. So the pattern is concerned to set in place procedures to enable quality not only to be consistently assured, but also enhanced.

**ANALYSIS:** Institutions of higher education need to operate their e-learning centres in a consistent manner offering the highest quality in all services, functions and operations. The e-learning centre needs to evaluate its services, products and progress against realistic goals and objectives. The evaluation will provide findings for ongoing improvement of the centre's activities and products.

**SOLUTION:** Systematic production and project management processes are crucial for the successful running of the centre. Mechanisms need to exist to gather feedback, to report on the feedback and for action to be taken in response to feedback.

Typical actions for quality assurance and quality enhancement will include an annual internal review process as a mechanism for assessment of performance and the meeting of goals and objectives. The review will include gathering feedback from all users of the centre eg from academic staff and from students taking e-learning courses. The review will lead to an annual report which is likely to be presented to the committee or board responsible for overseeing the centre, such as an institutional teaching and learning committee.

It is also likely that the centre's ongoing work will be overseen by a steering group or management team including the centre leader and key centre staff, together with representation from users across the institution and key senior management. Such a group are likely to meet on a regular basis, say once a month to monitor progress as well as to suggest new developments and initiatives.

Many established e-learning centres will also organise a periodic evaluation, usually involving evaluators independent of the centre. It is typical for such reviews to be five yearly and to lead to a substantial evaluation report, with recommendations for improvements that can be used by the centre leader and centre staff.

**RELATED PATTERNS:**

#### 4.1 Web sites on e-learning

<http://www2.tisip.no/E-LEN/>

<http://www.elearningeuropa.info/>

<http://www.elearningguild.com/>

<http://www.digitalthink.com/dtfs/>

#### Web sites on e-learning centres

Example sites for 'e-learning centres' from across the world

<http://www2.tisip.no/E-LEN/>

<http://www.e-learningcentre.co.uk/>

<http://www.e-learning-centre.com/ukpages/index.htm>

<http://www.melcoe.mq.edu.au/>

<http://www.bath.ac.uk/e-learning/>

<http://www.learnirect.co.uk/personal/northernireland/centres/profiles/newry/?view=Northern+Ireland>

<http://www.nottinghamschools.co.uk/eduweb/Department/department-template.aspx?id=185>

<http://www.cisco.com/ca/events/ecentre.shtml>

<http://domino.lancs.ac.uk/celt/learntech.nsf>

<http://www.iei.utk.edu/>

#### Online journals and newsletters on e-learning

<http://www.aace.org/pubs/IJEL/default.htm>

<http://www.ejel.org/>

<http://www.elearnmag.org/>

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## About E-LEN

E-LEN is a European network of institutions with e-learning expertise. The network was established to share and develop information and design patterns regarding e-learning. An important activity of the network is the dissemination of design patterns to interested parties.

The E-LEN project is part-funded by the European Union through the Minerva programme. The E-LEN partners are:

- University of Cyprus (co-ordinator)
- The Learning Lab, University of Maastricht (NL)
- CSALT, University of Lancaster (UK)
- A Priori Ltd (UK)
- Ilmenau Technical University (DE)s
- Hypermedia Open Center – Politecnico di Milano (IT)
- InterMedia, University of Bergen (NO)
- NITOL (NO)
- National Technical University of Athens (GR)
- Open University of the Netherlands (NL).

